

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

CALLAWAY GOLF COMPANY, )  
Plaintiff, ) C.A. No. 06-91 (SLR)  
v. ) JURY TRIAL DEMANDED  
ACUSHNET COMPANY, ) PUBLIC VERSION  
Defendant. )

**ACUSHNET COMPANY'S OPPOSITION TO CALLAWAY'S MOTION FOR  
SUMMARY JUDGMENT OF NO ANTICIPATION**

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## I. INTRODUCTION

Defendant Acushnet Company (“Acushnet”) hereby responds to Plaintiff Callaway Golf Company’s (“Callaway”) Motion for Summary Judgment of No Anticipation [D.I. 203], which should be denied. Acushnet has filed its own motions for Partial Summary Judgment that Nesbitt Incorporates Molitor ‘637 by Reference [D.I. 205] and for Summary Judgment of Invalidity of the Patents-in-Suit [D.I. 215], which should be granted.

Callaway’s motion for summary judgment (a) is based on a misreading of the law of incorporation by reference that disregards the most pertinent cases; (b) depends on an improper claim construction; and (c) attempts to unconvincingly ignore the undisputed facts that clearly establish the inherent properties of the materials disclosed in the prior art.

Callaway’s argument that the Nesbitt patent does not incorporate by reference the Molitor ‘637 patent is contradicted by case law. Courts that have considered nearly identical language as that found in Nesbitt have found an incorporation by reference as a matter of law. Callaway’s attempt to cloud the issue with self-serving testimony by its paid consultant, Mr. Nesbitt, fails. Mr. Nesbitt’s testimony as to what he intended is not relevant to whether, as a matter of law, the language of his patent constitutes an incorporation by reference.

In addition, Callaway’s argument that the Nesbitt patent does not disclose an outer cover layer with a Shore D hardness of less than 64 is based on an incorrect claim construction that ignores the definition of “Shore D hardness” provided in the specification of the patents-in-suit. Using the proper construction, there is no dispute that Nesbitt discloses an outer cover layer with a Shore D hardness of less than 64. Moreover, even under Callaway’s “on the ball” construction of Shore D hardness, Acushnet has demonstrated uncontroversely that a ball described by Nesbitt and Molitor ‘637 has a Shore D hardness of less than 64.

Finally, Callaway attempts to concoct a distinction between the Proudfoot patent and the Wilson Ultra Tour Balata ball that is unavailing. The evidence clearly shows that the Wilson Ultra Tour Balata ball had the same cover layers as those disclosed in the Proudfoot patent, and

Callaway has offered no contrary evidence. If there were any doubt, Acushnet submits herewith a declaration by Mr. Proudfit, the named inventor and the father of the Wilson Ultra Tour Balata, to that effect. Accordingly, the Proudfit patent and the Wilson Ultra Tour Balata each anticipate claims 1-2 of the '130 patent, neither of which require a polyurethane cover.

As Acushnet has presented ample evidence to support its inherency arguments, and Callaway has not provided any factual support to rebut Acushnet's proof, Callaway's motion should be denied. As set forth below, Callaway's arguments that Nesbitt does not incorporate Molitor '637 should also be denied.

## II. NATURE AND STAGE OF PROCEEDINGS

Callaway asserts that Acushnet's Pro V1 line of golf balls infringes four patents.<sup>1</sup> A two-week jury trial is scheduled to begin on December 3, 2007. Acushnet disputes infringement and contends that the patents-in-suit are invalid. Among several invalidity defenses that Acushnet asserts are that a) Nesbitt incorporating Molitor '637 anticipates the patents-in-suit; b) Proudfit anticipates claims 1-2 of the '130 patent; and c) the Wilson Ultra Tour Balata anticipates claims 1-2 of the '130 patent. On August 7, 2007 Acushnet filed a Motion for Summary Judgment of Invalidity of the asserted claims. [D.I. 216.] That Motion and its attached claim charts [D.I. 216, Appendices A-D] show that Nesbitt and Molitor '637 teach each limitation of Callaway's asserted claims, and that the arguments that Callaway sets forth in its Motion lack factual support. The motion also shows that Proudfit anticipates claims 1-2 of the '130 patent. [D.I. 216, Appendix B, at 1-3.]<sup>2</sup> Also on August 7, 2007, Acushnet filed a motion for partial summary

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<sup>1</sup> U.S. Patent Nos. 6,210,293 ("the '293 patent"); 6,506,130 ("the '130 patent"); 6,503,156 ("the '156 patent"); and 6,595,873 ("the '873 patent") (collectively "the patents-in-suit").

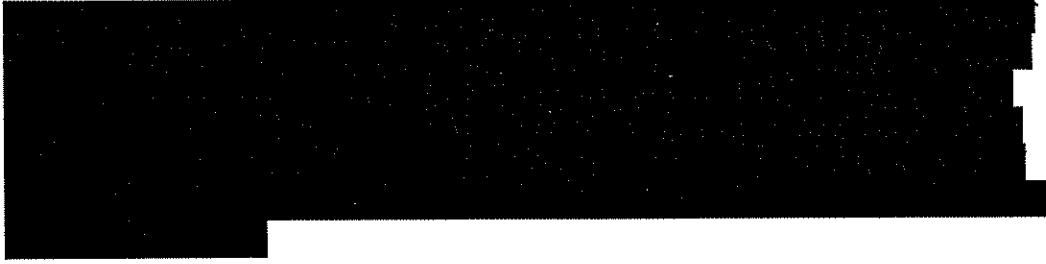
<sup>2</sup> Acushnet did not originally move for summary judgment that the Wilson Ultra Tour Balata ball anticipates claims 1-2 of the '130 patent. However, the evidence adduced by Acushnet in opposition to Callaway's motion and filed herewith leaves a clear record that in addition to being anticipated by Proudfit, claims 1-2 of the '130 patent are anticipated by the Wilson Ultra Tour Balata. *See Talecris Biotherapeutics, Inc. v. Baxter Int'l, Inc.*, C.A. No. 05-349-GMS, 2007 WL 1752840 at \*5 (D. Del. June 18, 2007) ("Where one party has invoked the power of the court to render a summary judgment against an adversary, [the court has] the power to render a summary

judgment that Nesbitt incorporates Molitor '637 by reference. [D.I. 205.] That motion demonstrates that Callaway's arguments regarding incorporation by reference (which present a legal, not a factual question) are incorrect, and that Nesbitt does incorporate Molitor '637 by reference.

### **III. FACTUAL BACKGROUND**

Acushnet set forth in its motion for summary judgment of invalidity the facts relevant to the background of golf ball prior art and the patents-in-suit. [D.I. 216, at 2-5.] Acushnet does not repeat those facts here. Callaway's motion, however, contains several misleading statements that require correction and clarification here.

Callaway relies on the fact that the Examiner reviewed the Nesbitt and Proudfit patents as evidence that its patents are valid. [D.I. 202, at 1.] What Callaway fails to disclose, however, is that Spalding did not provide the Examiner during prosecution with the inherent properties of the materials disclosed in both of those references. Thus, since the Examiner could not possibly have appreciated the pertinence of Nesbitt and Proudfit without knowledge of the inherent properties of the materials described therein, Callaway's point lacks any probative value.



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judgment for the adversary if it is clear that the case warrants that result, even though the adversary has not filed a cross-motion for summary judgment.") (citations omitted).

Indeed, the PTO recognized this fact when it ordered reexamination of the patents-in-suit (“These teachings of viewing Nesbitt alone and Nesbitt and Molitor ‘637 taken together were not present in the prosecution of the application leading to the Sullivan patent.”) [D.I. 10, Ex. A at 8.]

Moreover, no Examiner fully considered the Proudfit patent because Spalding filed an illegitimate Rule 1.131 declaration purporting to “swear behind” Proudfit. [See D.I. 60 ¶¶ 59-69.] This declaration was improper because it is not permissible to swear behind a patent that issued more than one year prior to the effective filing date of the application under review. *See* 37 C.F.R. 1.131(a)(2); 35 U.S.C. § 102(b). Here, the Proudfit patent issued on May 24, 1994, more than one year before the effective filing dates the PTO has determined apply to the patents-in-suit.<sup>3</sup> Prior to Spalding’s submission of this improper declaration, the Examiner had indicated that Proudfit taught all of the limitations of the claims at issue except for the hardness limitations, for which Spalding had not provided any information. *See* Office Action Dated June 28, 1998 in Application Serial No. 08/870,585 (Ex. 1) at CW 0300411.

#### IV. SUMMARY OF ARGUMENT

Acushnet has demonstrated that the asserted claims of the patents-in-suit are anticipated. Callaway’s arguments otherwise are unavailing as they are based on an incorrect reading of the law, an improper claim construction, and a willful ignorance of the undisputed facts.

First, Callaway is incorrect that the Nesbitt patent<sup>4</sup> does not incorporate the Molitor ‘637 patent<sup>5</sup> by reference. Nesbitt clearly identifies the Molitor ‘637 patent by both application number and patent number. Nesbitt also clearly identifies with detailed particularity the specific materials from Molitor ‘637 it incorporates (“foamable compositions”). *See* Ex. 2, col. 3, lines

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<sup>3</sup> The PTO determined that the effective filing date for the ‘293 patent, ‘156 patent, and ‘873 patent was November 9, 1995. [D.I. 10, Ex. A at 10; D.I. 10, Ex. B at 6; D.I. 10, Ex. D at 6.] It determined that the effective filing date for the ‘130 patent was October 13, 1995. [D.I. 10, Ex. C at 5.] Both of these dates are more than year after Proudfit’s issue date of May 24, 1994. Proudfit is thus prior art to each patent-in-suit under 35 U.S.C. § 102(b).

<sup>4</sup> U.S. Patent No. 4,431,193 (Ex. 2) (“Nesbitt”).

<sup>5</sup> U.S. Patent No. 4,274,637 (Ex. 3) (“Molitor ‘637”).

56-61. Callaway admits that Molitor '637 discloses polyurethane as a cover material and that such a cover material is a "foamable composition." [D.I. 202 at 11.] Thus, the polyurethane of Molitor '637 was properly incorporated by reference by Nesbitt, as a matter of law.

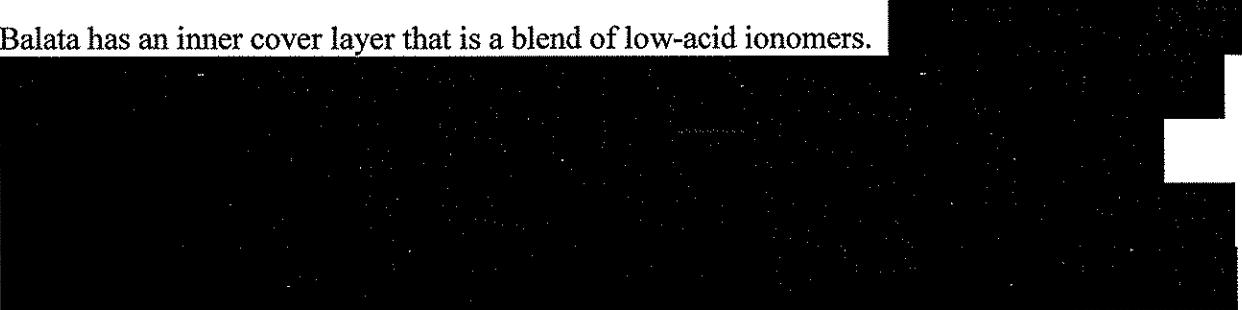
Callaway's argument seems to suggest that there must be a specific reference to column and line numbers for there to be an incorporation by reference, which is a proposition supported by no law. To the contrary, several cases have found an incorporation with nearly identical language to that set forth in Nesbitt. Callaway offers no cases on similar facts that support its conclusion. Instead, the cases Callaway cites involved naked citation to references, with no description whatsoever of the reference. Those cases are in stark contrast to the language of Nesbitt. In addition, Callaway's self-serving, after-the-fact testimony elicited from its long-time employee and now paid consultant, Mr. Nesbitt, is legally irrelevant to the question of incorporation by reference.

[REDACTED]

Second, Callaway's argument that the Nesbitt patent does not disclose an outer cover layer with a Shore D hardness of less than 64 is based on an incorrect claim construction. [D.I. 202 at 3.] Callaway ignores the specification of the patents-in-suit, which defines Shore D hardness as a measurement taken in accordance with ASTM D-2240. ASTM D-2240 requires an "off the ball" measurement. Under the correct construction, there is no dispute that the outer cover layer material disclosed in Nesbitt has a Shore D hardness of less than 64. In addition, even if the incorrect "on the ball" claim construction is adopted, Acushnet's expert, Dr. MacKnight has made balls with the dimensions and materials disclosed in Nesbitt and Molitor '637, and the "on the ball" Shore D hardness of those balls was shown to be less than 64. Thus, under any claim construction, Nesbitt incorporating Molitor '637 by reference anticipates the asserted claims.

Third, Callaway fails in its attempt to fabricate an evidentiary gap in Acushnet's arguments on the Proudfit patent. Acushnet has demonstrated that the Wilson Ultra Tour Balata ball, which used the identical cover materials as those disclosed in the Proudfit patent, had an outer cover layer hardness of less than 64, even when measured "on the ball." Undeterred, Callaway tries to argue that the Wilson Ultra Tour Balata might have a different outer cover material than the Proudfit patent, despite clear evidence to the contrary. Mr. Proudfit, in fact, submitted a declaration to the PTO during the prosecution of his patent wherein he stated that the outer cover layer of the Wilson Ultra Tour Balata utilized the cover formulation from Table 7 of his patent. [D.I. 216, Ex. 47 at CW 0302947.] Nevertheless, to eliminate any doubt about the construction of the Wilson Ultra Tour Balata, Acushnet submits another sworn declaration from Mr. Proudfit, in which he states that the cover materials in the Wilson Ultra Tour Balata were identical to those set forth in the Proudfit patent.<sup>6</sup> Acushnet's testing of the Wilson Ultra Tour Balata establishes that the outer cover layer material of Proudfit inherently has a Shore D hardness of less than 64, and therefore the Proudfit patent anticipates claims 1-2 of the '130 patent.

Fourth, Callaway inexplicably argues that there is no evidence that the Wilson Ultra Tour Balata has an inner cover layer that is a blend of low-acid ionomers.



Any doubt that Callaway tries to manufacture is destroyed by Mr. Proudfit's declaration, in which he states that the inner cover layer of the Wilson Ultra Tour Balata was the same blend of low-acid ionomers set forth in Table 6 of the Proudfit patent. Thus, the Wilson Ultra Tour Balata ball anticipates claims 1-2 of the '130 patent.

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<sup>6</sup> Ex. 5, Declaration of James R. Proudfit ("Proudfit Decl.").

## V. APPLICABLE LAW

Anticipation requires that a single prior art reference disclose each and every limitation of the claimed invention. *Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1379-80 (Fed. Cir. 2003). “[A] prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1343 (Fed. Cir. 2005) (citation omitted). Furthermore, so-called secondary considerations are only relevant to obviousness cases, and have no relevance to an anticipation analysis. *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1562 n.10 (Fed. Cir. 1983) (Davis, J. dissenting); *In re Fracalossi*, 681 F.2d 792, 796 (C.C.P.A. 1982) (Miller, J. concurring) (stating that “the so-called ‘secondary considerations’ relevant to a case of *prima facie* obviousness are not considered for purposes of determining anticipation.”)

Even if all the limitations of a claim are not found in a single prior art reference, material not explicitly disclosed in the reference may still be considered for purposes of anticipation if it is incorporated by reference into the prior art reference. *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1283 (Fed. Cir. 2000). “Incorporation by reference provides a method for integrating material from various documents into a host document . . . by citing such material in a manner that makes clear that the material is effectively part of the host document as if it were explicitly contained therein.” *Id.* at 1282-83. Whether material has been incorporated by reference into a host document is a question of law. *Id.* at 1283.

In *In re Application of Voss*, 557 F.2d 812, 816 (C.C.P.A. 1977), the court reversed the Board of Patent Appeals and Interferences and found that the language “*Reference is made to* United States Patent No. 2,920,971, granted to S. D. Stookey, for a general discussion of glass-ceramic materials and their production,” was an effective incorporation by reference. *Id.* at 816-17 (emphasis added). The court found that “[i]t is clear that appellant intended the ‘discussion of glass-ceramic materials and their production’ in Stookey ‘971 to become part of his parent application.” *Id.* at 817. Similarly, in *In re Hughes*, 550 F.2d 1273 (C.C.P.A. 1977), the court

found that a subject Clampitt patent properly incorporated a reference by stating “*Reference is made to* application Ser. No. 131,108 for complete descriptions of methods of preparing aqueous polymeric dispersions applicable in the hereinafter described invention.” *Id.* at 1274-76 (emphasis added). The court went on to explain that “the 131,108 disclosure of these methods is part of the Clampitt disclosure and must be considered in determining what the reference as a whole would have fairly suggested to one of ordinary skill in the art.” *Id.* at 1276.

The Federal Circuit has held that “[t]o incorporate material by reference, the host document must identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents.” *Advanced Display Sys.*, 212 F.3d at 1282. As recently as 2002, in *S. Clay Prods., Inc. v. United Catalysts, Inc.*, 43 Fed. Appx. 379 (Fed. Cir. 2002), the language of *In re Application of Voss* was recognized to meet this standard, quoted with approval, and relied on by the Federal Circuit in holding that an incorporation by reference had been effected.

Merely citing to a document with no explanation does not “identify material with detailed particularity,” as for example, the United States District Court for the District of Delaware has recently noted in applying the standard for incorporation by reference set forth in *Southern Clay Products, Voss, and Hughes*. *See Telcordia Tech., Inc. v. Lucent Techs.*, C.A. Nos., 04-875-GMS, 04-876-GMS, 2007 U.S. Dist LEXIS 31960 at \*32-38 (D. Del. May 1, 2007) (applying the test for incorporation by reference set forth in these cases and finding that the “referencing” document, a mere citation with no explanation, did not identify the specific subject matter that was to be incorporated); *see also SRI Int'l, Inc. v. Internet Sec. Sys.*, 456 F. Supp. 2d 623, 634 n.23 (D. Del. 2006) (finding that a technical paper, “Emerald 1997,” which merely cited to twenty-four other references did not incorporate the cited articles by reference).

## VI. ARGUMENT

### A. Nesbitt Incorporates The Polyurethane Of Molitor '637.

As an initial matter, Acushnet has previously demonstrated in its own motion that Nesbitt effectively incorporates Molitor '637 by reference. [See D.I. 205]. There, Acushnet shows that the Federal Circuit and its predecessor court have found on multiple occasions that the *exact language* of Nesbitt has effectively incorporated material by reference into a patent. Nesbitt states that:

The inner, intermediate, or first layer or ply 14 and the outer cover, second layer or ply 16 or either of the *layers may be cellular when formed of a foamed natural or synthetic polymeric material*. Polymeric materials are preferably such as ionomer resins which are foamable. *Reference is made to* the application Ser. No. 155,658, of Robert P. Molitor issued into *U.S. Pat. No. 4,274,637 which describes a number of foamable compositions of a character which may be employed for one or both layers 14 and 16 for the golf ball of this invention*.

(Ex. 2, col. 3, lines 51-61.) (emphasis added).

This language is nearly identical to, and indeed is more specific than, the incorporation language cited in *Voss, Hughes, and S. Clay Prods.*, discussed above. Callaway's unsupported arguments that Nesbitt fails to incorporate Molitor '637 hence fly in the face of controlling precedent.

Callaway relies on *In re De Seversky*, 474 F.2d 671, 674 (C.C.P.A. 1973) for the proposition that “[m]ere reference to another application, or patent, or publication is not an incorporation of anything.” [D.I. 202 at 8.] However, Callaway does not provide the Court with any comparison between the purported incorporation by reference language found in *In re De Seversky* and that found in Nesbitt. That is because no comparison can be made. In that case the applicant argued that because an application is identified as a continuation-in-part of its parent, it thereby incorporates the contents of its parent application by reference. *De Seversky*, 474 F.2d at 673-74. The CCPA found that this “reference” was not adequate to effect an incorporation by reference. *Id.* at 674. It is in this context that the CCPA made the statement that “mere reference” to another application is not an incorporation by reference. That is, merely claiming

priority back to a parent application does not effectuate an incorporation by reference of the parent application.

Indeed, subsequent to deciding *De Seversky* the CCPA explicitly found *on multiple occasions* that the *exact* language used by Nesbitt to incorporate Molitor '637 was effective to incorporate material by reference. *See Hughes*, 550 F.2d at 1276; *Application of Voss*, 557 F.2d at 816. Thus, Callaway's arguments must fail as matter of law as inconsistent with controlling authority. Nesbitt explicitly refers to the Molitor '637 patent by using the application serial number and the patent number itself.

Callaway essentially argues that Nesbitt describes ionomers as a preferred embodiment, and because Molitor '637 does not identify polyurethanes as a preferred embodiment, Nesbitt and Molitor '637 "teach away" from the polyurethane and other non-ionomeric materials disclosed in Molitor '637. Callaway cites no authority for this proposition because the Federal Circuit has explicitly found that Callaway's argument lacks merit. *See Syntex L.L.C. v. Apotex, Inc.*, 407 F.3d 1371, 1380 (Fed. Cir. 2005), *aff'd*, 221 Fed. Appx. 1002 (Fed. Cir. 2007) ("A statement that a particular combination is not a preferred embodiment does not teach away absent clear discouragement of that combination."). Further, Callaway fails to read the Nesbitt language of Nesbitt in its proper context. Nesbitt refers to both *natural* and synthetic materials as suitable for the ball's cover layers. Ex. 2, col. 3, lines 53-54. Ionomers are not natural, thus Nesbitt must have been referring to more than just ionomers. Finally, even if these references did teach away from this combination (which they do not), this is of no relevance to the incorporation by reference inquiry. *See S. Clay Prods.*, 43 Fed. Appx. at 384 ("Teaching away, however, is neither relevant to the question of anticipation nor to the question of incorporation by reference.").

Because neither Nesbitt nor Molitor '637 "clearly discourage" the use of polyurethanes (or any non-ionomers), and thus, do not "teach away" from the use of polyurethane, and because such an inquiry is irrelevant to incorporation by reference, Callaway's unsupported arguments to the contrary should be dismissed.

**1. Callaway's Extrinsic Evidence Is Of No Relevance To An Incorporation By Reference Analysis.**

Callaway spends a great deal of its brief citing to various extrinsic sources in an attempt to muddle a clear question of law that should be determined from the language of the document itself. *See Advanced Display Sys.*, 212 F.3d at 1283 (“Whether and to what extent material has been incorporated by reference into a host document is a question of law.”).

In particular, Callaway relies heavily upon the testimony of one of its paid consultants, Dennis Nesbitt, the named inventor of the Nesbitt patent.<sup>7</sup> However, Mr. Nesbitt’s testimony is of no probative value on the issue of incorporation by reference. Mr. Nesbitt is not qualified to opine on the legal question of incorporation by reference, nor is it his place to do so.

Incorporation by reference is an objective inquiry that is determined from the perspective of the hypothetical person of ordinary skill in the art. *See id.* Mr. Nesbitt’s subjective views are not what is important—the question is what would a person of ordinary skill in the art, lacking Mr. Nesbitt’s subjective knowledge, think that the statement is referring to upon reading both of the references. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 985 (Fed. Cir. 1995) (“No inquiry as to the subjective intent of the applicant or PTO is appropriate or even possible in the context of a patent infringement suit. The subjective intent of the inventor . . . is of little or no probative weight.”).

[REDACTED]

<sup>7</sup> [REDACTED]

<sup>8</sup> The fact that an attorney drafted this language makes it even more likely that it was intended to comply with the legal requirements of incorporation by reference as set forth in *Voss* and *Hughes*. Furthermore, this language was in keeping with PTO practice at the time for incorporating material by reference. *See* MPEP § 608.01(p) B. (“The referencing application must include . . . (3) an identification of the referenced patent or application . . . Particular

[REDACTED]

All in all, after-the-fact inventor testimony regarding the meaning of a patent is frowned upon by the Federal Circuit, as it sheds little light on this legal question. *See, e.g., Bell & Howell Document Mgmt. Prods. v. Altek Sys.*, 132 F.3d 701, 706 (Fed. Cir. 1997) (“The testimony of an inventor often is a self-serving, after the fact attempt to state what should have been part of his or her patent application . . .”). As such, the inquiry for this legal question should remain focused on the language of the Nesbitt patent.

Callaway also devotes significant time to arguing that Molitor ‘637 is directed to “foamable covers” and not polyurethane. [D.I. 202 at 12.] However, Callaway admits in its brief that the polyurethane composition specified in Molitor ‘637 is itself a “foamable composition.” [D.I. 202 at 11]; Ex. 3, col. 18, lines 33-47. Thus, polyurethane, along with the other seven foamable compositions of Molitor ‘637, is clearly identified by the language of Nesbitt. As discussed above, Callaway’s arguments that polyurethane is not preferred are simply irrelevant attempts to confuse the issue. *See Syntex L.L.C.*, 407 F.3d at 1379.

**2. Molitor ‘637 Discloses Only One Ionomer Composition, Yet Nesbitt Incorporates “A Number of Foamable Compositions.”**

Callaway argues that Nesbitt refers only to the disclosure of ionomers found in Molitor ‘637 when it refers to foamable compositions, and to no other materials. [D.I. 202 at 9-11.] This argument is flawed. Nesbitt specifically identifies the “foamable compositions” of Molitor ‘637, thus referring to these compositions in the plural. There are eight foamable compositions in Molitor ‘637. *See Ex. 3, Tables 1-12.* Only one of these compositions contains an ionomer. *See Ex. 3, Tables 1-5* (setting forth the same ionomer composition). Thus, Nesbitt expressed more than just ionomers when it referenced Molitor ‘637’s “foamable compositions.” Callaway’s

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attention should be directed to specific portions of the referenced patent or application.”) (Fourth Ed., 1979) (Ex. 7).

attempt to read the phrase “foamable compositions” as identifying only a single ionomer composition is inconsistent with English grammar, and thus should be dismissed.

**3. Column And Line Numbers Are Not Necessary To Provide “Detailed Particularity.”**

Callaway apparently argues that since Nesbitt does not cite Molitor ‘637 by column and line number, it has failed to incorporate Molitor’s foamable compositions. There is no support for this argument. The Federal Circuit and the CCPA have frequently found that a patent incorporated another patent by reference without citation to column and line numbers, or indeed to any specific portion of the patent. *See Hughes*, 550 F.2d at 1274-76; *Application of Voss*, 557 F.2d at 816; *see also Liebel-Flarsheim Co. v. Medrad, Inc.*, 481 F.3d 1371, 1381-82 (Fed. Cir. 2007) (finding that U.S. Patent No. 4,006,736 was effectively incorporated by reference into U.S. Patent No. 5,383,858 with the following language: “Fig. 1. discloses a injector apparatus 20 of the general type disclosed in the U.S. Patent No. 4,006,736 . . . .”) (quoted material appears in U.S. Patent No. 5,383,858); *Cook Biotech, Inc. v. Acell, Inc.*, 460 F.3d 1365, 1375 (Fed. Cir. 2006) (finding that U.S. Patent No. 4,902,508 was effectively incorporated by reference into U.S. Patent No. 5,553,389 with the language “The preparation of UBS from a segment of urinary bladder is similar to the procedure for intestinal submucosa detailed in U.S. Pat. No. 4,902,508. . . .”) (quoted material appears in U.S. Patent No. 5,553,389). The Federal Circuit and CCPA did not require pinpoint citations in any of these cases to find incorporation by reference, and such citations are not a requirement for incorporation by reference.

Notably, Nesbitt is even more specific than the references discussed above in identifying the incorporated subject matter with “detailed particularity.” As discussed in Acushnet’s Opening Summary Judgment Brief [D.I. 202 at 5], Nesbitt identifies the foamable compositions of Molitor ‘637 and provides explicit instructions for their use in a three-piece golf ball. Ex. 2, col. 3, lines 65-67; col. 4, lines 7-11. Thus, it easily provides the requisite “detailed particularity” to incorporate by reference.

**B. Nesbitt Inherently Discloses An Outer Cover Layer Having A Shore D Hardness Of 64 Or Less.**

Callaway's arguments that Nesbitt does not disclose an outer cover layer with a Shore D hardness of less than 64 are premised upon its erroneous "on the ball" claim construction. If Acushnet prevails in its "off the ball" claim construction argument, as it should, Callaway's arguments of no inherency become moot. Furthermore, even under Callaway's proposed claim construction, Acushnet has shown that the Shore D hardness limitations were inherently present in Nesbitt, incorporating by reference Molitor '637.

**1. Under The Proper Claim Construction There Is No Dispute That Nesbitt Discloses An Outer Cover Layer With A Shore D Hardness Of Less Than 64.**

Callaway's arguments regarding Shore D hardness are premised on an incorrect claim construction. The specifications of the patents-in-suit expressly define the term "Shore D hardness" as a measurement taken "in accordance with ASTM D-2240." *See, e.g.*, '293 patent, col. 7, lines 20-21. The ASTM D-2240 standard expressly prohibits taking a Shore D measurement on a "rounded" or "uneven" surface, such as the curved surface of a golf ball cover. [D.I. 207, Ex. I at § 6.1.] For that reason, and additional reasons set forth in Acushnet's Opening Claim Construction Brief [D.I. 207 at 10-20], the "Shore D hardness" limitations of the asserted claims refer to measurements taken on a plaque, or "off the ball" measurements.

There is no dispute that Nesbitt discloses the use of Surlyn® 1855 as the outer cover layer of the golf ball. Ex 2, col. 3, lines 34-44.



Similarly, there is no dispute that Molitor '637 discloses the use of Estane 58133 polyurethane as a cover layer material. Ex. 3, col. 18, lines 33-41; Ex. 8, Risen Tr. 156:23-157:13. There is also no dispute that Estane 58133 has a Shore D hardness, as measured "off the ball" of 55, just like Surlyn® 1855. [D.I. 216, Ex. 39.]

Accordingly, regardless of whether Nesbitt incorporates by reference Molitor '637, Nesbitt inherently discloses an outer cover layer with a Shore D hardness of less than 64, if the

term “Shore D hardness” is properly construed to refer to an “off the ball” measurement. Thus, if the Court does not adopt Callaway’s proposed claim construction, Acushnet has shown that Nesbitt anticipates the asserted claims, and Callaway’s arguments regarding the Shore D hardness values of Nesbitt must also be rejected.

**2. Even Under Callaway’s Erroneous Claim Construction, Nesbitt Incorporating Molitor ‘637 Inherently Discloses An Outer Cover Layer With A Shore D Hardness Of Less Than 64.**

Acushnet has demonstrated, even under Callaway’s proposed construction of “Shore D hardness,” that Nesbitt inherently discloses an outer cover layer with a Shore D hardness of less than 64. Specifically, Dr. MacKnight made several golf balls using the core described by Nesbitt, the ionomer-blend inner cover layer described by Molitor ‘637, and the polyurethane outer cover described by Molitor ‘637. He measured the Shore D hardness of the outer cover layer “on the ball,” as Callaway’s proposed construction would require, and found that the hardness measured consistently at less than 64. [D.I. 216, Ex. 30 ¶ 33.] Specifically, that ball construction had a Shore D hardness of 62.0 as measured “on the ball.” *Id.* Thus, Nesbitt, incorporating Molitor ‘637, inherently discloses an outer cover layer with a Shore D hardness of less than 64, as measured on the ball.

Callaway has presented absolutely no contrary evidence. Instead, Callaway makes the inapposite argument that it is impossible to predict the outer cover layer hardness with any degree of accuracy. Callaway reasons that a variety of factors, including the thickness and hardness of the underlying material, the thickness of the layer itself and the size and shape of the sample, make the “on the ball” hardness values so unpredictable that it would be dangerous to even hazard a guess as to what these values would be. [D.I. 202 at 16.] Callaway’s arguments, however, ignore Dr. MacKnight’s uncontroverted testing. Here, there is no need to predict what the “on the ball” hardness of the Nesbitt/Molitor ball would be; instead, the balls themselves have been made and measured. In addition, the wide variety of tests performed by Dr.

MacKnight show that the underlying construction of the golf ball actually has fairly minimal impact on the “on the ball” Shore D measurement of the resulting cover layer.<sup>9</sup>

Thus, Acushnet has shown that Nesbitt discloses, through its incorporation of Molitor ‘637, a polyurethane outer cover with an “on the ball” Shore D hardness of 64 or less. Claim charts attached as Appendices A-D to D.I. 216 detail this evidence. Callaway cannot defeat Acushnet’s hard evidence of inherency with unsupported theory and speculation.

### **C. Proudfit Anticipates Claims 1 And 2 Of The ‘130 Patent.**

Callaway argues that Acushnet has not shown that Proudfit discloses an outer cover with a Shore D hardness of 64 or less and thus cannot show that Proudfit anticipates claims 1 and 2 of the ‘130 patent. [D.I. 202 at 20.] Callaway is wrong for several reasons.

#### **1. The Wilson Ultra Tour Balata Used The Same Outer Cover As The Proudfit Patent, And Had A Shore D Hardness Well Under 64.**

Callaway incorrectly focuses only on Proudfit’s disclosure that the outer cover layer may be formed of balata. [D.I. 202 at 20.] Proudfit also discloses an outer cover composition comprising a blend of synthetic balata (trans-polyisoproprene) and polybutadiene (and other materials), in Table 7, which is reproduced below:

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<sup>9</sup> For example, Wu’s polyrurethane was measured as the outer cover layer of three different balls with three different structures. The “on the ball” measurements for each ball were 56.0, 55.6, and 56.8. [D.I. 215, Ex. 30 ¶ 33.] Thus, these measurements are consistent and do not display the wild variation that Callaway asserts. Similarly, balls of three different constructions using Nesbitt incorporating Molitor ‘637’s outer cover layer had Shore D hardnesses of 62.0, 61.0, and 59.4. *Id.* Finally, Molitor ‘751’s urethane/ionomer blend had the following Shore D hardness values when measured on three different prior art balls: 50.1, 49.6, and 51.2. *Id.* Thus, the underlying structures of the balls have only a minimal effect on the Shore D hardness values made “on the ball,” and in all cases these values are below 64. *Id.*

TABLE 7

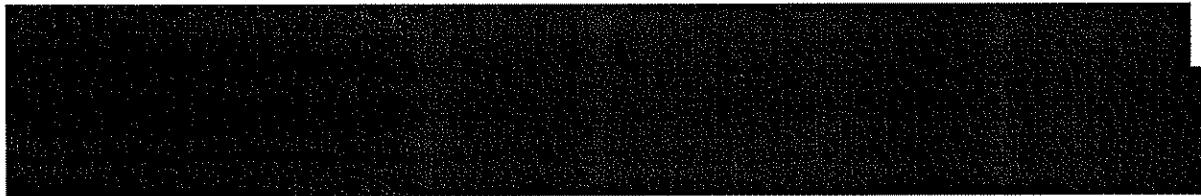
Composition of Outer Layer (Parts by Weight)	
Trans PolyIsoprene (TP-301)	60.00
Polybutadiene	40.00
Zinc Oxide	5.00
Titanium DiOxide	17.00
Ultramarine Blue color	.50
Zinc DiAcrylate	35.00
Peroxide (Varox 230 XL)	<u>2.50</u>
<b>Total</b>	<b>160.00</b>

Proudfit (Ex. 9), col. 8:46-55. This outer cover composition is the same composition that was used in the outer cover of the Wilson Ultra Tour Balata ball available in 1993.

To confirm that the outer cover layer of the Wilson Ultra Tour Balata had the same outer cover layer composition as Table 7 of the Proudfit patent, Acushnet has questioned Mr. Proudfit and obtained his sworn declaration. Ex. 5, Proudfit Decl. Mr. Proudfit was intimately involved with the development and design of the Wilson Ultra Tour Balata ball and attests that the outer cover layer of the Wilson Ultra Tour Balata ball available in 1993 was produced with the same composition set forth in Table 7 of the Proudfit patent. Ex. 5, Proudfit Decl. ¶ 6.

Mr. Proudfit said precisely the same thing in a declaration submitted in 1993 during the prosecution of the Proudfit '187 patent, produced by Callaway from its own files. Mr. Proudfit declared to the PTO that the Wilson Ultra Tour Balata utilized the cover layer set forth in Table 7 of the Proudfit patent. [D.I. 216, Ex. 47 ¶ 14.] Callaway's arguments, therefore, that the record lacks any evidence regarding the construction of the Wilson Ultra Tour Balata is without merit. Indeed, there is no evidence that contradicts Mr. Proudfit's declarations.

Thus, there can be no dispute that the Wilson Ultra Tour Balata ball available in 1993 had the same outer cover composition as that disclosed as the preferred embodiment of Proudfit. Thus, "on the ball" measurements of the hardness of the Wilson Ultra Tour Balata ball are indicative of the hardness of the ball disclosed in Proudfit. Callaway's own expert, Dr. Risen, has admitted as much. [REDACTED]



Acushnet tested the Wilson Ultra Tour Balata in 1993. This testing was done as part of its routine testing of competitive golf balls. *See* Ex. 10, AC0072945. Acushnet's test results record the following:

<b>COVER</b>	<b>primary component</b> other polymer <b>thickness</b> <b>noncentrally</b> <b>hardness</b>	<b>c-polybutadiene</b> synthetic balata <b>0.090</b> <b>0.007</b> <b>52</b>
--------------	---	---

*Id.*

Acushnet's contemporaneous "on the ball" testing thus unambiguously shows that the Shore D hardness of the outer cover layer of the Wilson Ultra Tour Balata was 52, which is soft and well under the claimed hardness of 64. *See also* Ex. 11, Hebert Decl. ¶ 7. Furthermore, recent "on the ball" testing of the Wilson Ultra Tour Balata shows a cover layer hardness of less than 64 Shore D measured "on the ball." *See* [D.I. 216, Ex. 34, at AC0131413.]<sup>10</sup>

Accordingly, Acushnet has shown that Proudfit inherently discloses an outer cover with a Shore D hardness of 64 or less, specifically the cover of the Wilson Ultra Tour Balata, or Proudfit Table 7. Callaway has offered no evidence showing that the Wilson Ultra Tour Balata has a Shore D hardness of 64 or greater. Thus, this fact is uncontested.

<sup>10</sup> This recent testing of more than a dozen Wilson Ultra Tour Balata balls manufactured in 1993 demonstrated an average "on the ball" Shore D hardness value of 60.4. [D.I. 215, Ex. 34, at AC0131413.] The hardness values for individual balls ranged from 56.2 to 62.3. *Id.* Hence, even after aging and hardening for approximately 15 years, the Wilson Ultra Tour Balata still has an "on the ball" Shore D hardness well within the broad range claimed by the patents-in-suit.

**2. Proudfit Also Discloses The Use Of Balata As A Cover Material, Which Also Has A Shore D Hardness Of Less Than 64.**

Proudfit's disclosure of balata itself as an outer cover material also satisfies claims 1-2 of the '130 patent, because balata inherently has a Shore D hardness of less than 64. Proudfit states that the outer cover material can be made of balata alone. Ex. 9, col. 5:13-17 (disclosing a golf ball with "an outer cover layer of soft material such as balata or a blend of balata and other elastomers"). As Proudfit describes, balata is a very soft material. It inherently has a Shore D hardness of less than 64.

Callaway's principal argument regarding the hardness of balata is no more than an attack on Acushnet's expert, Dr. Statz, who stated that he did not know the precise hardness of balata. Dr. Statz did state in no uncertain terms, however, that it was well known in the art in 1995 that balata had a Shore D hardness of less than 64. Ex. 12, Statz Report ¶ 98, at 30. Dr. Statz's opinion is based on his experience in the field, and from testing other properties of balata. Ex. 6, Statz Dep. Tr. 275:22-277:13. Dr. Statz's opinion is confirmed by the testimony of other artisans, who agreed that balata is a soft material that would be measured at well under 64 Shore D.

[REDACTED]

[REDACTED]

Callaway does not offer any evidence that the hardness of balata could be greater than 64.

[REDACTED]

[REDACTED]

Thus, Dr. Risen is not in a position to dispute Dr. Statz's opinion that a balata golf ball cover would inherently have a hardness of less than 64. Thus, in addition to its disclosure of the composition of Table 7, Proudfit also satisfies claims 1-2 of the '130 patent by its disclosure of balata as the outer cover layer material.

**3. Callaway Does Not Dispute The Presence Of Any Other Limitations Of Claims 1-2 Of The '130 Patent In Proudfit.**

Callaway does not dispute that Proudfit discloses the other limitations of claims 1-2 of the '130 patent, including:

- a core;
- an inner cover layer with a) a Shore D hardness of 60 or more, b) a thickness of about 0.100 to about 0.010 inches, and c) a blend of low-acid ionomers;
- an outer cover with a) a thickness of about 0.010 to about 0.070 inches, and b) comprising the claimed “relatively soft polymeric material”; and
- the golf ball having the properties required by the U.S.G.A and an overall diameter of 1.680 inches or more.

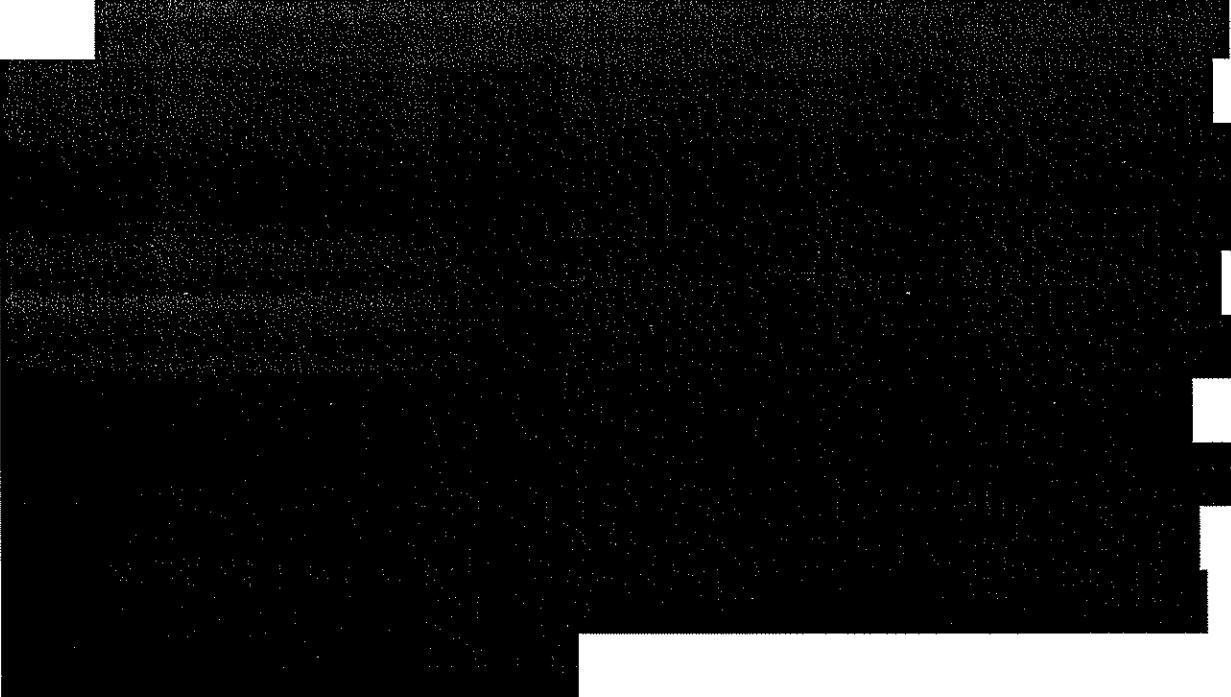
Thus, not only should Callaway’s motion for no anticipation be denied, but Acushnet’s motion for summary judgment that Proudfit anticipates claims 1-2 of the '130 patent [D.I. 216] should be granted.

**D. The Wilson Ultra Tour Balata Ball Anticipates Claims 1 And 2 Of The '130 Patent.**

Callaway’s only argument that the Wilson Ultra Tour Balata ball does not anticipate claims 1 and 2 of the '130 patent is its contention that there is insufficient evidence of the composition of the inner cover layer. Callaway argues that there is insufficient evidence that the inner cover layer of the Wilson Ultra Tour balata was a low-acid blend.

To ensure that there is no doubt that the inner layer of the Wilson Ultra Tour Balata ball was a blend of low-acid ionomers, Acushnet questioned Mr. Proudfit, the inventor of the Proudfit '187 patent and developer of the Wilson Ultra Tour Balata ball, and obtained his declaration. Mr. Proudfit attests and would testify that the composition of the inner cover layer of the Wilson Ultra Tour Balata is the composition listed in Table 6 of the '187 patent, which is a blend of Surlyn® 8940 and Surlyn® 9910. Ex. 5, Proudfit Decl. ¶ 5; Ex. 9, col. 8:25-30. There

is no dispute that those Surlyn® grades are both low-acid ionomers.<sup>11</sup> Thus, any shred of doubt that Callaway has attempted to fabricate about the composition of the inner cover layer of the Wilson Ultra Tour Ball is eliminated by Mr. Proudfit's declaration. Accordingly, there can be no genuine dispute that the inner cover layer of the Wilson Ultra Tour Balata was a blend of low-acid ionomers.



Callaway offers speculative suggestions that the ionomers used in the Wilson Ultra Tour balata ball could be the high-acid ionomers known as Surlyn® 8220, 8240, or 9220. [D.I. 202 at 23.] As Mr. Proudfit's declaration and Dr. Statz's testimony demonstrate, those are simply not the ionomers used in the Wilson Ultra Tour Balata's inner cover. Thus, no weight should be placed in Callaway's misleading attempt to suggest that the inner cover layer of the Wilson Ultra Tour Balata could have been composed of those high-acid ionomers.

Callaway does not dispute the presence of any other limitations of claims 1 and 2 of the '130 patent in the Wilson Ultra Tour Balata. In particular, it does not contest that the Wilson Ultra Tour Balata had the other limitations of claims 1 and 2 of the '130 patent, including:

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<sup>11</sup> See, e.g., '293 patent, col. 3, lines 20-27. ("Surlyn 8940 is . . . about 15 weight percent acid . . . Surlyn 9910 is about 15 weight percent acid . . .").

- a core;
- an inner cover layer with a) a Shore D hardness of 60 or more, and b) a thickness of about 0.100 to about 0.010 inches;
- an outer cover with a) a Shore D hardness of 64 or less, b) a thickness of about 0.010 to about 0.070 inches, and c) comprising the claimed “relatively soft polymeric material”; and
- the golf ball having the properties required by the U.S.G.A and an overall diameter of 1.680 inches or more.

*See* ‘130 patent, col. 21:60-22:38. Notably, Callaway’s validity expert, Dr. Risen, provided no opinion whatsoever in response to Dr. Statz’s opinion that claims 1 and 2 of the ‘130 patent are anticipated by the Wilson Ultra Tour Balata. Ex. 8, Risen Tr. at 174:4-175:5.

In light of the fact that the only limitation Callaway disputes as being present in the Wilson Ultra Tour Balata has been shown to be indisputably present, and the fact that Callaway’s expert has provided no opinion on anticipation by that ball, Acushnet suggests that summary judgment that claims 1-2 of the ‘130 patent are anticipated by the Wilson Ultra Tour Balata ball should be granted in its favor, not Callaway’s.

## VII. CONCLUSION

For the foregoing reasons, Callaway's motion for partial summary judgment of no anticipation should be denied. Instead, Acushnet's motion for summary judgment of anticipation [D.I. 215] should be granted, and the Court should also grant summary judgment that the Wilson Ultra Tour Balata ball available in 1993 anticipates claims 1-2 of the '130 patent.

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Dated: August 20, 2007

Public Version Dated: August 27, 2007 *Attorneys for Defendant Acushnet Company*  
815150 / 30030

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

CERTIFICATE OF SERVICE

I, David E. Moore, hereby certify that on August 27, 2007, the attached document was electronically filed with the Clerk of the Court using CM/ECF which will send notification to the registered attorney(s) of record that the document has been filed and is available for viewing and downloading.

I hereby certify that on August 27, 2007, I have Electronically Mailed the document to the following person(s):

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# EXHIBIT 1

RECEIVED  
JUL 27 1998File Wrapper Continuation  
Application Transmittal Form  
37 C.F.R. 1.62

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket No. SLD 2 035-3-3-1  
 Anticipated Classification  
 of this application:  
 Class        Subclass         
 Prior application:  
 Examiner: M. Graham  
 Art Unit: 3304

Assistant Commissioner  
 for Patents  
 Box FWC  
 Washington, D.C. 20231

Sir:

This is a request for filing a file wrapper continuation application under 37 C.F.R. 1.62, of pending prior application serial no. 08/556,237 filed on November 9, 1995 of Michael J. Sullivan for Improved Multi-Layer Golf Ball. (There has been no amendment of the title or the named applicants.)

1. xxx The above identified application in which no payment of issue fee, abandonment of, or termination of proceedings has occurred, is hereby expressly abandoned as of the filing date of this new application. Please use all the contents of the prior application file wrapper, including the drawings, as the basic papers for the new application.
2.        A verified statement to establish small entity status under 37 C.F.R. 2.9 and 1.27        is enclosed        was filed in the prior application and such status is still proper and desired (37 C.F.R. 1.28(a)).
3. xxx The filing fee is calculated below.

"Express Mail" Mailing Label Number EM217532984US  
 Date of Deposit June 6, 1997

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the

Assistant Commissioner for Trademarks

2900 Crystal Drive, Arlington, VA 22202-3513.

Christina Calabrese

(TYPED OR PRINTED NAME OF SENDER)  
Christina Calabrese  
 (SIGNATURE)

**CLAIMS AS FILED IN THE PRIOR APPLICATION  
LESS ANY CLAIMS CANCELLED BY AMENDMENT BELOW**

Basic Fee	Small Entity Large Entity	\$385.00 \$770.00	\$ 770.00
Total claims	8 - 20 = 0	x \$11.00 x \$22.00	\$ 0.00
Indep. claims	3 - 3 = 0	x \$40.00 x \$80.00	\$ 0.00
<b>Total fee</b>			<b><u>\$ 770.00</u></b>

4. xxx The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Account No. 06-0308. A duplicate copy of this sheet is enclosed.

5. xxx A check in the amount of \$770.00 is enclosed.

6. xxx Amend the specification by inserting before the first line the sentence: -- This is a continuation of application serial no. 08/556,237, filed November 9, 1995, which, in turn, is a continuation in part of an application filed on October 13, 1995, which, in turn, is a continuation in part of serial no. 08/070,510, filed June 1, 1993. --

7.        Priority of application serial no. \_\_\_\_\_ filed on \_\_\_\_\_ in \_\_\_\_\_ is claimed under 35 U.S.C. §119.

       The certified copy has been filed in prior application serial no. \_\_\_\_\_, filed \_\_\_\_\_.

8. xxx The prior application is assigned of record to Lisco, Inc.

9. xxx The power of attorney in the prior application is to Christopher B. Fagan, Reg. No. 22,987  
Richard M. Klein, Reg No. 33,000;

a. xxx The power appears in the original papers in the prior application.

b.        Since the power does not appear in the original papers, a copy of the power in the prior application is enclosed.

c. xxx Address all future communications to

Christopher B. Fagan  
FAY, SHARPE, BEALL, FAGAN,  
MINNICH & MCKEE  
1100 Superior Avenue  
Suite 700  
Cleveland, Ohio 44114-2518  
(216) 861-5582

10. xxx A preliminary amendment is enclosed. (Claims added by this amendment have been properly numbered consecutively beginning with the number next following the highest numbered original claim in the prior application.

11. xxx A Request for a 3-Month Extension of Time and fee are being filed herewith by Express Mail to extend the term in the pending prior U.S. Application Serial No.08/556,237 until June 6, 1997.

12. xxx Please abandon prior the application when the petition for extension of time in that application is granted and when this application is granted a filing date so as to make this application copending with said prior application.

The undersigned declare further that all statements made herein of his or her own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

6/97  
\_\_\_\_\_  
Date

Address of Signator:  
FAY, SHARPE, BEALL, FAGAN,  
MINNICH & MCKEE  
1100 Superior Avenue  
Suite 700  
Cleveland, Ohio 44114  
(216) 861-5582

\_\_\_\_\_  
Reg. No. 33,000  
Richard M. Klein  
Attorney of Record

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF : Sullivan et al.  
FOR : IMPROVED MULTI-LAYER GOLF BALL  
SERIAL NO. :  
FILED : Herewith  
ATTORNEY DOCKET NO. : P-3724-2/SLD 2 035-3-3-1  
Cleveland, Ohio 44114-2518  
June 6, 1997

Assistant Commissioner  
of Patents  
Washington, D.C. 20231

RECEIVED  
JUL 27 1998

PRELIMINARY AMENDMENT

Dear Sir:

In reply to the Office Action (Final) of December 6, 1996,  
kindly amend the application as follows:

In The Claims:

2. Amended. A golf ball according to claim 1, wherein  
the inner cover layer has a thickness of about 0.100 to about  
0.010 inches and the outer cover layer has a thickness of about  
0.010 to about 0.70 inches, the golf ball having the properties  
required by the U.S.G.A. and having an overall diameter of 1.680  
inches or more.

3. Amended. A golf ball according to Claim 1 wherein the inner cover layer has a thickness of about 0.050 inches and the outer cover layer has a thickness of about 0.055 inches, the golf ball having the properties required by the U.S.G.A. and having an overall diameter of 1.680 inches or more.

Remarks

The Examiner's comments set forth in the Office Action of December 6, 1996 have been considered in detail. In response to the Examiner's assertion that Claims 2 and 3 fail to require the ball to meet U.S.G.A. standards, these claims have been amended appropriately. Claims 2 and 3 (as amended) now specifically require the claimed ball to meet the parameters set forth by the U.S.G.A. standards, i.e. must be a regulation ball. In view of these amendments, it is respectfully submitted that Claims 2 and 3 are in condition for allowance. If the Examiner's concurs, dependent Claims 2 and 3 will be rewritten and placed in independent form.

Respectfully submitted,

FAY, SHARPE, BEALL, FAGAN,  
MINNICH & MCKEE

6/1/97  
Date

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Cleveland, OH 44114-2518  
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RECEIVED

JUL 27 1998

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF : Sullivan et al.  
FOR : IMPROVED MULTI-LAYER  
GOLF BALL  
SERIAL NO. : 08/566,237  
FILED : November 9, 1995  
EXAMINER : M. Graham  
ART UNIT : 3304  
LAST OFFICE ACTION : December 6, 1996  
ATTORNEY DOCKET NO. : SLD 2 035-3-3  
Cleveland, Ohio 44114  
June 6, 1997

REQUEST FOR A THREE-MONTH EXTENSION OF TIME

Assistant Commissioner  
of Patents  
Washington, D.C. 20231

Dear Sir:

The initial period for response to the outstanding Official Action, issued December 6, 1996, expired on March 6, 1997.

Pursuant to 37 C.F.R. 1.136 petition is hereby made for a three-month extension of time up to and including June 6, 1997, in which to respond to the Official Action. A check in the amount of \$930.00 for the extension fee is enclosed herewith.

CW 0300408

- 2 -

Authorization is hereby provided to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0308.

Respectfully submitted,

FAY, SHARPE, BEALL, FAGAN,  
MINNICH & McKEE

*TM*

Richard M. Klein  
Reg. No. 33,000  
1100 Superior Avenue  
Suite 700  
Cleveland, Ohio 44114  
(216) 861-5582

CERTIFICATE OF MAILING

I hereby certify that this REQUEST FOR A THREE-MONTH EXTENSION OF TIME is being deposited with the United States Postal Service as express mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D. C., 20231, on this 6th day of June, 1997.

By: Christina Calabrese



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, DC 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/870, 585	06/06/97	SULLIVAN	SLD-2-035-3-3-1

**RECEIVED**

JUL 21 1998

0811/0708

EXAMINER

GRAHAM, M

CHRISTOPHER B FAGAN  
FAY SHARPE BEALL FAGAN  
MINNICH AND MCKEE  
1100 SUPERIOR AVENUE SUITE 700  
CLEVELAND OH 44114-2518

ART UNIT

3711

PAPER NUMBER

**RECEIVED**

DATE MAILED: 07/08/98

JUL 10 1998

FAY, SHARPE, BEALL, FAGAN,  
MINNICH & MCKEE

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**“DOCKETED”**

Serial Number: 08/870,585

Page 2

Art Unit: 3711

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Proudfit.

Proudfit discloses the claimed invention with the exception of the particular Shore D hardness claimed. However, Proudfit discloses a hard inner cover and softer outer cover formed from materials such as those disclosed by the applicant. Obviously the exact hardness of the layers would have been up to the ordinarily skilled artisan depending on distance and feel considerations.

Absent a showing of unexpected results, the particular parameters of Proudfit's ball, which is formed from the same materials in the same fashion claimed by applicant, would have been obvious to one of ordinary skill in the art.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Serial Number: 08/870,585

Page 3

Art Unit: 3711

Claims 1-6 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending Application No. 08/920,070. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: a golf ball with a hard inner and soft outer layer.

Claims 1-6 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending Application No. 08/926,246. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: a golf ball with a hard inner and soft outer layer.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending applications. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP Section 804.

Serial Number: 08/870,585

Page 4

Art Unit: 3711

Any inquiry concerning this communication should be directed to Mark S. Graham at telephone number (703) 308-1355.

MSG  
June 28, 1998

Mark S. Graham  
Primary Examiner

<b>Office Action Summary</b>	Application No. <b>08/870,585</b>	Applicant(s) <b>Sullivan</b>
	Examiner <b>Mark S. Graham</b>	Group Art Unit <b>3711</b>

**Responsive to communication(s) filed on Jun 6, 1997**

**This action is FINAL.**

**Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.**

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

#### Disposition of Claims

**Claim(s) 1-6 is/are pending in the application.**

**Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.**

**Claim(s) \_\_\_\_\_ is/are allowed.**

**Claim(s) 1-6 is/are rejected.**

**Claim(s) \_\_\_\_\_ is/are objected to.**

**Claims \_\_\_\_\_ are subject to restriction or election requirement.**

#### Application Papers

**See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.**

**The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.**

**The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.**

**The specification is objected to by the Examiner.**

**The oath or declaration is objected to by the Examiner.**

#### Priority under 35 U.S.C. § 119

**Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).**

**All  Some\*  None of the CERTIFIED copies of the priority documents have been**

**received.**

**received in Application No. (Series Code/Serial Number) \_\_\_\_\_.**

**received in this national stage application from the International Bureau (PCT Rule 17.2(a)).**

**\*Certified copies not received: \_\_\_\_\_**

**Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).**

#### Attachment(s)

**Notice of References Cited, PTO-892**

**Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_**

**Interview Summary, PTO-413**

**Notice of Draftsperson's Patent Drawing Review, PTO-948**

**Notice of Informal Patent Application, PTO-152**

**-- SEE OFFICE ACTION ON THE FOLLOWING PAGES --**

<b>Notice of References Cited</b>			Application No. <b>08/870,685</b>	Applicant(s) <b>Sullivan</b>		
			Examiner <b>Mark S. Graham</b>	Group Art Unit <b>3711</b>	Page 1 of 1	
<b>U.S. PATENT DOCUMENTS</b>						
	DOCUMENT NO.	DATE	NAME		CLASS	SUBCLASS
A	<b>5,314,187</b>	<b>5/94</b>	<b>Proudfoot</b>		<b>473</b>	<b>374</b>
B						
C						
D						
E						
F						
G						
H						
I						
J						
K						
L						
M						
<b>FOREIGN PATENT DOCUMENTS</b>						
	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
N						
O						
P						
Q						
R						
S						
T						
<b>NON-PATENT DOCUMENTS</b>						
	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)				DATE	
U						
V						
W						
X						

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF : Sullivan et al.  
FOR : IMPROVED MULTI-LAYER GOLF  
BALL  
SERIAL NO. : 08/870,585  
FILED : June 6, 1997  
EXAMINER : M. Graham  
ART UNIT : 3711  
LAST OFFICE ACTION : July 8, 1998  
ATTORNEY DOCKET NO. : SLD 2 035-3-3-1  
  
Cleveland, Ohio 44114-2518  
October 8, 1998

Amendment and Response Under 37 CFR § 1.115

Assistant Commissioner for Patents  
Washington, DC 20231

Dear Sir:

This amendment is responsive to the Office Action of July 8,  
1998.

CERTIFICATE OF MAILING

I hereby certify that this AMENDMENT is being deposited with the United States  
Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for  
Patents, Washington, DC 20231, on this 8th day of October, 1998.

By: Mary Ann Temesvari  
Mary Ann Temesvari

**REMARKS**

The Office Action of July 8, 1998 has been fully considered by the Applicant. In view of the following comments, reconsideration of the application is respectfully requested.

**The Office Action**

Claims 1-6 stand rejected under 35 USC § 103(a) as being unpatentable over Proudfit (US 5,314,187).

Claims 1-6 stand provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending application No. 08/920,070.

Claims 1-6 stand provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending application No. 08/926,246.

**Provisional Double Patenting Rejections**

Claims 1-6 have been provisionally rejected over claims 1-8 of copending US Application No. 08/920,070 and claims 1-8 of copending US Application No. 08/926,246.

Applicants are of the opinion that the instant application's claims are not exactly the same as the claims of each of 08/920,070 and 08/926,246. However, upon indication of allowable subject matter, applicants will provide a Terminal Disclaimer, if required and appropriate, to overcome the double patenting rejections.

At this time applicant believes no Terminal Disclaimer is necessary as no allowable subject matter has been indicated in this or the copending applications.

**Rejection Under 35 USC § 103**

Claims 1-6 have been rejected under 35 USC § 103(a) as being unpatentable over Proudfit. Specifically, the Examiner states in the Office Action at page 2:

"Proudfit discloses the claimed invention with the exception of the particular Shore D hardness claimed. However, Proudfit discloses a hard inner cover and softer outer cover formed from materials such as those disclosed by the applicant. Obviously the exact hardness of the layers would have been up to the ordinarily skilled artisan depending on distance and feel considerations. Absent a showing of unexpected results, the particular parameters of Proudfit's ball, which is formed from the same materials in the same fashion claimed by applicant, would have been obvious to one of ordinary skill in the art."

Applicants are of the opinion that the Examiner has not addressed or has misinterpreted material limitations present in the claims. Specifically, with respect to the type of material used in the outer cover, the Examiner has failed to provide a teaching of the use of the particular comparatively softer non-ionomeric thermoplastic or thermosetting elastomers (claim 1) such as polyurethane (claim 5) or, polyesters, polyester elastomers, polyether polyurethane and polyester amides (claim 6).

#### The Present Invention

The invention of this application (claims 1-6) is directed to improved multi-layer golf ball cover compositions and the resulting multi-layer golf balls produced thereby. The novel multi-layer golf balls of the invention include a first or inner layer or ply of a low acid (16 weight percent acid or less) ionomer or ionomer blend. A second or outer layer or ply is included in the multi-layered golf balls comprised of a comparatively softer, non-ionomeric thermoplastic or thermosetting elastomer such as polyurethane, a polyester elastomer or a polyesteramide. Preferably, the inner layer or ply includes a blend of low acid ionomers and has a Shore D hardness of 60 or more and the outer cover layer comprises a polyurethane and has a Shore D hardness of about 45. The multi-layer golf balls of the invention can be of standard or enlarged size.

It has been found that multi-layer golf balls having inner and outer cover layers exhibit higher C.O.R. values and have greater travel

distance in comparison with balls made from a single cover layer. In addition, it has been found that use of an inner cover layer constructed of a blend of low acid (i.e., 16 weight percent acid or less) ionomer resins produces softer compression and higher spin rates than inner cover layers constructed of high acid ionomer resins. Furthermore, it has been discovered that use of a softer polyurethane outer layer adds to the desirable "feel" and high spin rate while maintaining respectable resiliency. The soft outer layer allows the cover to deform more during impact and increases the area of contact between the club face and the cover, thereby imparting more spin on the ball. As a result, the soft polyurethane cover provides the ball with a balata-like feel and playability characteristics with improved distance and durability.

Consequently, the overall combination of the inner low acid ionomer resin cover layer and the outer cover layer made from polyurethane elastomers and non-ionomeric resins results in a standard size or oversized golf ball having *enhanced resilience* (improved travel distance) and *durability* (i.e. cut resistance, etc.) characteristics while maintaining and in many instances, improving the balls playability properties. Specifically, it has been found that the combination of a low acid ionomer blend inner cover layer with a soft, relatively low modulus ionomer, polyurethane based elastomer outer cover layer provides for good overall coefficient of restitution (i.e., enhanced resilience) while at the same time demonstrating improved compression and spin. The outer cover layer generally contributes to a more desirable feel and spin, particularly at lower swing speeds with highly lofted clubs such as half wedge shots.

#### The Prior Art

Proudfit teaches a two layer cover for a golf ball. The two layer cover comprises an inner layer which is molded over a solid or wound core and an outer layer which is molded over the inner layer. The inner layer is formed from a relatively hard, cut-resistant material such as ionomer resin, and the outer layer is formed from relatively soft material such as elastomeric or polymeric material selected from the class consisting of natural balata,

synthetic balata, natural rubber, polybutadiene, and polyoctenylene rubber.

**The Claimed Invention Distinguishes Patentability  
and Unobviously Over the Cited Art**

The present invention, as claimed, requires an outer cover which is comprised of a relatively soft (compared to the inner cover) polymeric material selected from non-ionomer thermoplastic and thermosetting elastomers (claim 1) polyurethane elastomer (claim 5) or polyester elastomers, polyesters, polyester polyurethane or polyester amides (claim 6).

Applicant respectfully submits that Proudfit fails to teach or suggest the claim designated outer cover compositions of the present invention.

Specifically, Proudfit, while disclosing a two layer cover comprising a relatively hard inner cover and relatively softer outer cover, fails to recognize the undesirable properties of a balata containing outer cover. As specifically set forth in the specification at page 2 of the specification:

"Despite all the benefits of balata, balata covered golf balls are easily cut and/or damaged if mis-hit. Golf balls produced with balata or balata-containing cover compositions therefore have a relatively short lifespan."

The present invention, utilizes the claim designated multi-layer cover which has an outer cover comprising non-ionomer thermoplastic and thermosetting elastomers, such as polyurethane elastomers. Thus the present invention avoids the cut and abrasion propensities of balata while retaining the spin and feel characteristics of balata through the use of the claimed multi-layer structure.

As can be seen in Table 9 of the instant application (page 46), spin rates of the golf balls according to the present invention having softer polyurethane elastomer outer covers and harder inner covers (ball No.'s 23-25) are as high as, if not better than, comparable golf balls having Z-balata covers and the same harder inner covers. However, as can be seen from Table 9, scuff resistance is greater for the golf balls according to the present invention (scuff values of 1.5 for balls 23-25) compared to the Z-balata

covered balls which have scuff values of 3 (for samples 27-29). This advantage is not taught nor suggested by the prior art.

In summary, the present invention relates to a multi-layer golf ball which has a hard, low acid, inner layer and a relatively soft, non-ionomeric elastomer such as a polyurethane, a polyester elastomer or by a polyester amide outer layer. As more particularly indicated in Example 4, use of non-ionomeric elastomers (Formulations 23-25) to produce the outer cover layer, results in molded golf balls having softer compression, improved durability, higher spin, with similar COR values to that of balata covered golf balls. The data indicates that a very good multi-layer ball having enhanced durability can be made using non-ionomeric elastomers (i.e., polyurethane, etc.) as the material for the outer cover layers.

Consequently, the applicant respectfully submits that the golf balls according to the claimed invention are not obvious variants of the Proudfit balls as Proudfit does not recognize or provide motivation for the unexpected enhanced durability of the claimed balls while retaining desirable balata-like properties.

### Conclusion

In view of the above comments, it is believed that this application is in condition for allowance. Therefore, the Applicant respectfully requests favorable reconsideration and allowance of this application.

Respectfully submitted,

FAY, SHARPE, BEALL,  
FAGAN, MINNICH & MCKEE

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UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

P 3724-2-1

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/870,595	06/06/97	SULLIVAN	M SLD-2-035-3-

DIANE F. COVELLO, ESQ.  
DIVISION PATENT AND TRADEMARK COUNSEL  
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425 MEADOW STREET P.O. BOX 901  
CHICOPEE MA 01021-0901

OM11/1221

EXAMINER	
GRAHAM, M	ART UNIT

3711 11  
DATE MAILED:  
12/21/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

DEC 28 1998

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	08/870,585	Sullivan	
	Examiner Mark S. Graham	Group Art Unit 3711	

Responsive to communication(s) filed on Oct 13, 1998

This action is FINAL.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire .3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

**Disposition of Claims**

Claim(s) 1-6 is/are pending in the application.  
 Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 Claim(s) \_\_\_\_\_ is/are allowed.  
 Claim(s) 1-6 is/are rejected.  
 Claim(s) \_\_\_\_\_ is/are objected to.  
 Claims \_\_\_\_\_ are subject to restriction or election requirement.

**Application Papers**

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.  
 The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.  
 The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.  
 The specification is objected to by the Examiner.  
 The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).  
 All  Some\*  None of the CERTIFIED copies of the priority documents have been received.  
 received in Application No. (Series Code/Serial Number) \_\_\_\_\_.  
 received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

Notice of References Cited, PTO-892  
 Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_  
 Interview Summary, PTO-413  
 Notice of Draftsperson's Patent Drawing Review, PTO-948  
 Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Serial Number: 08/870,585

Page 2

Art Unit: 3711

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Proudfit for the reasons set forth in the previous action.

Applicant's argument is that Proudfit does not disclose the claimed relatively soft outer cover layer. This argument is not found persuasive. The claims call for an outer cover layer comprising "a relatively soft polymeric material selected from the group consisting of non-ionomer thermoplastic and thermosetting elastomers." Proudfit's outer layer may be constructed from elastomers including but not limited to several identified thermoplastic or thermosetting non-ionomer polymeric elastomers. Applicant himself recognizes these materials in the first line on page 5 of his remarks. As to the exact hardness of the outer layer note the examiner's remarks in the previous action. Applicant has not contested this portion of the rejection.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground.

Serial Number: 08/870,585

Page 3

Art Unit: 3711

provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending Application No. 08/920,070. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: a golf ball with a hard inner and soft outer layer.

Claims 1-6 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending Application No. 08/926,246. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: a golf ball with a hard inner and soft outer layer.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending

Serial Number: 08/870,585

Page 4

Art Unit: 3711

applications. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP Section 804.

Applicant's arguments filed 10/13/98 have been fully considered but they are not persuasive.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Mark S. Graham at telephone number (703) 308-1355.

MSG  
December 16, 1998

Mark S. Graham  
Primary Examiner

**P-3724-2-F1 PATENT**  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In re Application of: Michael J. Sullivan**  
**For: IMPROVED MULTI-LAYER GOLF BALL**  
**Serial No: 08/870,585**  
**Filed: June 6, 1997**

**Group Art Unit: 3711**  
**Examiner: M. Graham**

**Assistant Commissioner for Patents**  
**Washington, DC 20231**  
**ATTN: Application Processing Division**  
**Customer Correction Branch**

**Sir:**

**REQUEST FOR CORRECTED FILING RECEIPT**

1. Attached is a copy of the Official Filing Receipt received from the PTO in the above application for which issuance of a corrected Filing Receipt is respectfully requested.
2. There is an error in that the following data is

<input type="checkbox"/> incorrectly entered and/or <input type="checkbox"/> Applicant's name <input type="checkbox"/> Title <input type="checkbox"/> Serial Number <input type="checkbox"/> Foreign/PCT Application Reference <input checked="" type="checkbox"/> Other: <u>Priority Information</u>	<input checked="" type="checkbox"/> omitted <input type="checkbox"/> Applicant's address <input type="checkbox"/> Filing Date
--	---

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**CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. 1.8a)**

I hereby certify that this correspondence is, on the date shown below, being:

**MAILING**

deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Date: 2/4/99

**FACSIMILE**

transmitted by facsimile to the Patent and Trademark Office.

Diane F. Covello  
 Signature

Diane F. Covello Reg. No. 34,164

*D*

Serial No. 08/870,585

Filing Date June 7, 1997

P-3724-2-F1

The filing receipt should read as follows:

Under "CONTINUING DATA AS CLAIMED BY APPLICANT-", after "ABN", but on  
the next line, please insert --WHICH IS A CONTINUATION-IN-PART OF 08/542,793

10/13/95--.

3.        The correction is not due to any error by Applicant and no fee is due.  
XX The correction is due to Applicant's error and the fee therefor under 37 C.F.R.  
§ 1.19(h) of \$25.00 is paid as follows:  
XX Please charge Deposit Account 17-0150 in the amount of \$25.00.

Respectfully submitted,

Michael J. Sullivan

*Diane F. Covello*

Diane F. Covello  
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Reg. No. 34,164

(413) 493-2466

Date: 2-1-99

PTO-1000  
(Rev. 8-96)

FILING RECEIPT

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SEP 11 1997  
FAY, SHARPE, BEALL, FAGAN,  
MINNICH & MCKEEUNITED STATES GOVERNMENT OF COMMERCE  
Patent and Trademark Office  
ASSISTANT SECRETARY AND COMMISSIONER  
OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
08/870,585	06/06/97	3304	\$770.00	SLD-2-035-3-3-1		8	3

CHRISTOPHER B FAGAN  
 FAY SHARPE BEALL FAGAN  
 MINNICH AND MCKEE  
 1100 SUPERIOR AVENUE SUITE 700  
 CLEVELAND OH 44114-2518

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JUL 27 1998

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Application Processing Division's Customer Correction Branch within 10 days of receipt. Please provide a copy of the Filing Receipt with the changes noted thereon.

Applicant(s)

MICHAEL J. SULLIVAN, CHICOPEE, MA.

CONTINUING DATA AS CLAIMED BY APPLICANT-

THIS APPLN IS A CON OF 08/556,237 11/09/95 ABN  
 WHICH IS A CIP OF 08/070,510 06/01/93

FOREIGN FILING LICENSE GRANTED 08/12/97

TITLE  
 MULTI-LAYER GOLF BALL

PRELIMINARY CLASS: 273

which is a CIP of 08/542,793 10/13/95

"DOCKETED"

(see reverse)

CW 0300429

mailed 2/4/99

The Patent and Trademark Office acknowledges and has stamped hereon, the date of the receipt of the following items checked:

Docket No. P-3724-2-F1

Applicant Michael J. Sucovan

Reg/Serial No. 081870,585

Mark/Title Improved Multi-Layer Golf Ball

Trademark Appln: 3 specimens, Drawing

Power of Attorney & Fee Authorization

Application:        pages specification,  
       pages drawings,        formal,        informal

Declaration,        Assignment,        fee

Application Transmittal letter in Duplicate

Amendment

Affidavit 8 & 15 1 Spec., w/fee authorization

Assignment and fee authorization

Missing parts w/fee authorization

IDS, PTO-1449 &        refs.

Formal Drawings w/letter

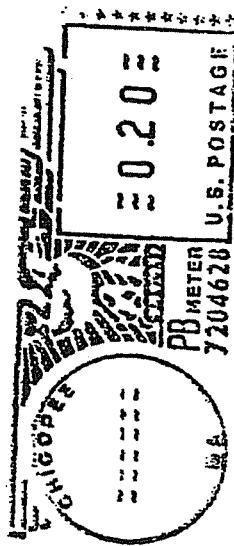
Issue Fee w/fee authorization

Notice of opposition w/fee authorization

Statement of Use, 3 Spec. w/fee authorization

Maintenance Fee w/fee authorization

REQUEST FOR  
CORRECTED FILING  
RECEIPT



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SPALDING SPORTS WORLDWIDE, INC.  
P O BOX 901  
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P-3734-2-F1 Mailed 2/4/97

CW 0300431

PTO-103X  
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UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
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Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
08/870,585	06/06/97	3711	\$770.00	SLD-2-035-3-	1	8	3

DIANE F. COVELLO, ESQ.  
DIVISION PATENT AND TRADEMARK COUNSEL  
SPALDING SPORTS WORLDWIDE  
425 MEADOW STREET P.O. BOX 901  
CHICOPEE MA 01021-0901

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Application Processing Division's Customer Correction Branch within 10 days of receipt. Please provide a copy of the Filing Receipt with the changes noted thereon.

**Applicant(s)**

MICHAEL J. SULLIVAN, CHICOPÉE, MA.

**CONTINUING DATA AS CLAIMED BY APPLICANT**

DATA AS CLAIMED BY THIS APPLN IS A CON OF 08/556,237 11/09/95 ABN  
WHICH IS A CON OF 08/542,793 10/13/95 ABN  
WHICH IS A CON OF 08/070,510 06/01/93 ABN

IF REQUIRED, FOREIGN FILING LICENSE GRANTED 08/12/97

**TITLE**

## MULTI-LAYER GOLF BALL

PRELIMINARY CLASS: 473

RECEIVED

DATA ENTRY BY: BRITTON, PAULA TEAM: 03 DATE: 03/23/99

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF	:	Michael J. Sullivan
FOR	:	IMPROVED MULTI-LAYERGOLF BALL
SERIAL NO.	:	08/870,585
FILED	:	June 6, 1997
EXAMINER	:	M. Graham
GROUP ART UNIT	:	3711
LAST OFFICE ACTION	:	December 21, 1998
ATTORNEY DOCKET NO.	:	SLD 2 035-3-3-1

**Cleveland, Ohio 44114-2518**  
**March 18, 1999**

**NOTICE OF APPEAL FROM THE PRIMARY EXAMINER**  
**TO THE BOARD OF PATENT APPEALS AND INTERFERENCE**

**Assistant Commissioner of Patents  
Washington, D.C. 20231**

Applicant hereby appeals to the Board from the decision of the Supervisory Patent Examiner dated December 21, 1998 finally rejecting claims 1-6. Pursuant to 37 C.F.R. § 1.17(b), applicants have enclosed a check for \$300.00 to cover the appeal fee. Authorization is hereby provided to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0308.

**CERTIFICATE OF MAILING**

I hereby certify that this NOTICE OF APPEAL is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on March 15, 1999.

By: Nancy J. King

Respectfully submitted,

FAY, SHARPE, BEALL, FAGAN,  
MINNICH & McKEE, LLP

*Richard M. Klein*

Richard M. Klein  
Reg. No. 33,000  
1100 Superior Avenue  
Suite 700  
Cleveland, OH 44114-2518  
(216) 861-5582

<b>Interview Summary</b>	Application No.	Applicant(s)
	08/870,585	Sullivan
	Examiner	Group Art Unit
	Mark S. Graham	3711

All participants (applicant, applicant's representative, PTO personnel):

(1) Mark S. Graham (3) \_\_\_\_\_

(2) Brian Bembenick (4) \_\_\_\_\_

Date of Interview Apr 9, 1999

Type:  Telephonic  Personal (copy is given to  applicant  applicant's representative).

Exhibit shown or demonstration conducted:  Yes  No. If yes, brief description:

\_\_\_\_\_

Agreement  was reached.  was not reached.

Claim(s) discussed: all generally

Identification of prior art discussed:

Proudfit

Description of the general nature of what was agreed to if an agreement was reached, or any other comments:

Applicant to file 131 affidavit swearing behind Proudfit reference. While the examiner pointed out that such would not be timely it was decided that if the examiner found the affidavit persuasive with regard to the co-pending 08/926,246 application (not under final) it would also be entered in the instant application.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

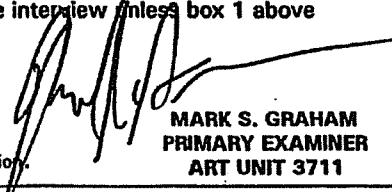
\_\_\_\_\_

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

1.  It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a response to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

2.  Since the Examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the interview unless box 1 above is also checked.

  
 MARK S. GRAHAM  
 PRIMARY EXAMINER  
 ART UNIT 3711

Examiner Note: You must sign and stamp this form unless it is an attachment to a signed Office action.

**PATENT**  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF : Michael J. Sullivan  
 FOR : IMPROVED MULTI-LAYER GOLF  
 BALLS  
 SERIAL NO. : 08/870,585  
 FILED : June 6, 1997  
 EXAMINER : M. Graham  
 GROUP ART UNIT : 3711  
 LAST OFFICE ACTION : December 21, 1998  
 ATTORNEY DOCKET NO. : SLD 2 0035-3-3-1  
 P-3724-2-F1

Cleveland, Ohio 44114-2518  
 September 20, 1999

**REQUEST FOR FOUR MONTH EXTENSION OF TIME**

Assistant Commissioner for Patents  
 Washington D. C. 20231

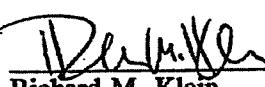
Dear Sir:

A Notice of Appeal was filed in connection with the above identified application on March 18, 1999. The original period for response expired on May 18, 1999.

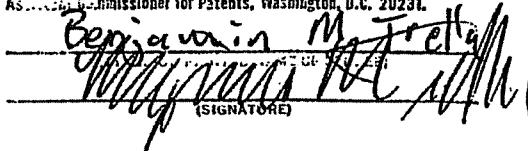
Pursuant to 37 C.F.R. 1.136 petition is hereby made for a four-month extension of time up to and including September 20, 1999 (September 18, 1999 being a Saturday) in which to respond to the Official Action. A check in the amount of \$1,360.00 for the extension fee is enclosed herewith.

Authorization is hereby provided to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0308.

Respectfully submitted,  
**FAY, SHARPE, FAGAN, MINNICH  
 & MCKEE LLP.**

  
 Richard M. Klein  
 Reg. No. 33,000  
 1100 Superior Avenue  
 Suite 700  
 Cleveland, Ohio 44114-2518  
 (216) 861-5582

"Express Mail" Mailing Label Number EL 35891310215  
 Date of Deposit 9-20-99  
 I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

  
 Benjamin M. Klein  
 (Signature)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application : Michael J. Sullivan  
For : IMPROVED MULTI-LAYER GOLF BALL  
Serial No. : 08/926,246  
Filed : September 5, 1996  
Examiner : M. Graham  
Art Unit : 3711  
Last Office Action : June 10, 1999  
Attorney Docket No. : SLD 2 035-1-2-2  
Cleveland, Ohio 44114-2518

**COPY**

**DECLARATION UNDER 37 C.F.R. §1.131**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

As a person signing below:

1. I, Michael J. Sullivan, do hereby declare and say that I am an inventor in the above-identified United States patent application, which Office Action has rejected the claims in said application over U.S. Patent No. 5,314,187 to Proudfit, filed on June 29, 1992 and issued on May 24, 1994.

2. I have read and am familiar with the above Office Action rejecting the claims of the present application. I have further read and am familiar with the Proudfit patent (U.S. 5,314,187) over which said above applicant's claims were rejected.

3. I declare that at a date prior to June 29, 1992, the effective filing date for the subject matter of Proudfit relied upon by the Examiner in the outstanding Office Action, the invention disclosed in the present application was completed in this country. In this regard, I have attached hereto copies of data reproduced from my Laboratory notes (dates

omitted), and other technical data material which establishes the completion of the invention prior to June 29, 1992. As can be seen from the attached data, Table 1 (Exhibit 1) corresponds to Table 7 of the present application and Table 2 (Exhibit 2) corresponds to data present in Table 8 of the present application. I hereby declare that the attached evidentiary materials were prepared prior to June 29, 1992.

4. Specifically, Table 1 attached hereto represents various inner cover layer blends used in preparing golf balls according to the present application. The blends shown in Table 1 for inner cover layers correspond to the blends for inner cover layers of Table 7 in the present application in the following manner.

<u>Attached Table 1</u> <u>Reference No.</u>	<u>U.S. 08/926,246</u> <u>Corresponding Table 7</u> <u>Reference Letter</u>
61-1	A
61-2	B
61-3	C
61-4	D
61-5	E

5. Table 1 gives the composition and properties of balls that were molded using materials that form the inner layer of the multi-layer ball. That is, (in Table 1) 1.680" diameter balls were molded over 1.545" diameter cores, giving a cover having a wall thickness of about 0.0675". These balls included the high acid materials from Exxon (ex. 61-1), DuPont (ex. 61-3) as well as zinc stearate loaded high acid (ex. 61-2), Surlyn 1605, now designated Surlyn 8940 (ex. 61-4) and a blend of Iotek 8000/7030 (ex. 61-5). The spin, COR, and other various properties are ultimately for comparison with the multi-layer balls according to the invention as shown in Table 2 (which corresponds to date in Table 8 of the present application).

6. The balls of Table 1 were then ground down to a size of 1.620" and covered with a "soft" outer layer to form the balls of Table 2.

7. Table 2 shows the resultant golf balls (1.680" diameter) using, as an outer layer, one of three materials, 1) a hard/soft ionomer blend according to the present application, 2) a polyurethane from B.F. Goodrich, and 3) Surlyn 9020 (previously designated Surlyn 1855).

8. The resultant balls depicted in Table 2 are represented in Table 8 of the present application as follows:

U.S. 08/926,246

<u>Attached Table 2</u>	<u>Corresponding Table 8</u>
<u>Reference No.</u>	<u>Reference No.</u>
544-84-1	1
544-84-2	2
544-84-3	3
544-84-4	4
544-84-5	5

9. It is noted that the component designated as "core" type in table 2, using identifiers 61-1 through 61-5, correspond to the intermediate balls having those same reference numbers in Table 1. Likewise, Table 8 of the present application also utilizes the intermediate golf balls of Table 7, A-D, which correspond to the intermediate balls 61-1 through 61-4 of Table 1 attached hereto (as set forth above).

10. Each of the dates deleted from Exhibits 1 and 2 is prior to June 29, 1992.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true ; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

*Michael J. Sullivan* Sept. 1, 1999  
 Michael J. Sullivan (Date)

Table 1

<u>544-</u>	<u>61-1</u>	<u>61-2</u>	<u>61-3</u>	<u>61-4</u>	<u>61-5</u>
Iotek EX-959	50	50	--	--	--
Iotek EX-960	50	50	--	--	--
Zinc Stearate	--	50	--	--	--
Surlyn 8162	--	--	75	--	--
Surlyn 8422	--	--	25	--	--
Surlyn 1605	--	--	--	100	--
Iotek 7030	--	--	--	--	50
Iotek 8000	--	--	--	--	50
Compression	58	58	60	63	62
COR	.811	.810	.807	.793	.801
Shore C Hardness	98	98	97	96	96
Spin Rate (RPM)*	7,367	6,250	7,903	8,337	7,956
Cut Resistance	4-5	4-5	4-5	4-5	4-5

\* Note: Test performed with a Tour Edition #9 iron and a club head speed of 105 fps.

Michael J. Sullivan

Table 2

544-84	-1	-2	-3	-4	-5
<u>"Core" Type</u>	<u>61-1</u>	<u>61-2</u>	<u>61-3</u>	<u>61-4</u>	<u>61-5</u>
Cover *	TE-90	TE-90	TE-90	TE-90	TE-90
Compression	63	63	69	70	62
COR	.784	.778	.780	.770	.779
Shore C Hardness	.88	.88	.88	.88	.88
Spin (RPM)	8,825	8,854	8,814	8,990	8,844
Cut Resistance	3-4	3-4	3-4	3-4	3-4

544-84	-6	-7	-8
<u>"Core" Type</u>	<u>61-1</u>	<u>61-5</u>	<u>61-4</u>
Cover	PU	PU	9020
Compression	67	69	61
COR	.774	.772	.757
Shore C Hardness	.74	.73	.89
Spin (RPM)	10,061	10,637	8,846
Cut Resistance	3-4	3-4	1-2

- \* A) PU is B.F.Goodrich Polyester Polyurethane X-4517
- B) TE-90 is 22.7 wt-% Iotek 8000; 22.7 wt-% Iotek 7030; 45.0 wt-% Iotek 7520; 9.6 wt-% White MB
- C) 9020 is Surlyn 9020

 J. Sullivan

**IX. APPENDIX OF CLAIMS (37 C.F.R. § 1.192 (c)(9))**

1. A golf ball comprising:

a core;

an inner cover layer having a Shore D hardness of 60 or more molded on said core, the inner cover layer comprising a blend of two or more low acid ionomer resins containing no more than 16% by weight of an alpha, beta-unsaturated carboxylic acid; and

an outer cover layer having a Shore D hardness of 64 or less molded on said inner cover layer, said outer cover layer comprising a relatively soft polymeric material selected from the group consisting of non-ionomeric thermoplastic and thermosetting elastomers.

2. A golf ball according to claim 1, wherein the inner cover layer has a thickness of about 0.100 to about 0.010 inches and the outer cover layer has a thickness of about 0.010 to about 0.70 inches, the golf ball having the properties required by the U.S.G.A. and having an overall diameter of 1.680 inches or more.

3. A golf ball according to claim 1, wherein the inner cover layer has a thickness of about 0.050 inches and the outer cover layer has a thickness of about 0.055 inches, the golf ball having the properties required by the U.S.G.A. and having an overall diameter of 1.680 inches or more.

4. A golf ball according to claim 1 wherein the outer layer comprises a polyurethane based material.

5. A multi-layer golf ball comprising:

a spherical core;  
an inner cover layer having Shore D hardness of about 60 or more molded over said spherical core, said inner cover layer comprising an ionomeric resin including no more than 16% by weight of an alpha, beta-unsaturated carboxylic acid and having a modulus of from about 15,000 to about 70,000 psi;

an outer cover layer having a Shore D hardness of about 64 or less molded over said spherical intermediate ball to form a multi-layer golf ball, the outer layer comprising polyurethane based material.

6. A multi-layer golf ball comprising:

a spherical core;  
an inner cover layer molded over said spherical core to form a spherical intermediate ball, said inner cover layer comprising an ionomeric resin having no more than 16% by weight of an alpha, beta-unsaturated carboxylic acid and having a modulus of from about 15,000 to about 70,000 psi;

an outer cover layer molded over said spherical intermediate ball to form a multi-layer golf ball, the outer layer comprising a non-ionomer elastomer selected from the group consisting of polyester elastomer, polyester, polyether polyurethane and polyester amide, said outer cover layer having a modulus in a range of about 1,000 to about 30,000 psi.

**PATENT****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF : Michael J. Sullivan  
 FOR : IMPROVED MULTI-LAYER GOLF  
 BALL  
 SERIAL NO. : 08/870,585  
 FILED : June 6, 1997  
 EXAMINER : M. Graham  
 GROUP ART UNIT : 3711  
 LAST OFFICE ACTION : December 21, 1988  
 ATTORNEY DOCKET NO. : SLD 2 035-3-3-1/  
 P-3724-2-F1

Cleveland, Ohio 44114-2518  
 September 20, 1999

**APPEAL BRIEF UNDER 37 C.F.R. 1.192**

Assistant Commissioner for Patents  
 Washington, D.C. 20231

Dear Sir:

Appellant files herewith an Appeal Brief (submitted in triplicate) in connection  
 with the above-identified application, wherein claims 1-6 were finally rejected in the Office  
 Action of December 21, 1988. What follows is Appellant's Appeal Brief in accordance with  
 37 C.F.R. §1.192(a):

"Express Mail" Mailing Label Number 1358913702US  
 Date of Deposit 9-20-99  
 I hereby certify that this paper or fee is being deposited with the United  
 States Postal Service "Express Mail Post Office to Addressee" service  
 under 37 CFR 1.10 on the date indicated above and is addressed to the  
 Assistant Commissioner for Patents, Washington, D.C. 20231.

Benjamin M. Sullivan  
 TYPED OR PRINTED NAME OF SIGNER  
 (Signature)

**I. REAL PARTY IN INTEREST (37 C.F.R. § 1.192(c)(1))**

The real parties in interest in this appeal are the inventor named in the caption of this brief (Michael J. Sullivan) and his assignee, Spalding Sports Worldwide, Inc. (formerly Lisco, Inc.)

**II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 1.192(c)(2))**

Commonly owned application serial no. 08/920,070 is currently on appeal. As the present application is subject to a non-statutory provisional double patenting rejection over copending serial no. 08/920,070, the decision in 08/920,070 may have a bearing on the Board's decision in this appeal.

**III. STATUS OF CLAIMS (37 C.F.R. § 1.192(c)(3))**

The status of the claims set forth after the Final Office Action mailed December 21, 1998 was, and is, as follows:

Allowed claims: none

Rejected claims: 1-6

The present appeal is directed specifically to claims 1-6.

**IV. STATUS OF THE AMENDMENTS (37 C.F.R. § 1.192(c)(4))**

In the Final Office Action of December 21, 1998, the Examiner rejected claims 1-6 under 35 U.S.C. §103(a) as being obvious over Proudfit (U.S. Patent No. 5,314,187).

No amendments after final have been submitted.

**V. SUMMARY OF INVENTION (37 C.F.R. § 1.192(c)(5))**

The invention of this application is directed to improved multi-layer golf ball cover compositions and the resulting multi-layer golf balls produced thereby. The novel multi-layer golf balls of the invention include a first or inner layer or ply of a low acid (16 weight percent acid or less) ionomer or ionomer blend. A second or outer layer or ply is included in the multi-layered golf balls comprised of a comparatively softer, non-ionomeric thermoplastic or thermosetting elastomer such as polyurethane, a polyester elastomer or a polyesteramide. Preferably, the inner layer or ply includes a blend of low acid ionomers and has a Shore D hardness of 60 or more and the outer cover layer comprises a polyurethane and has a Shore D hardness of about 45. The multi-layer golf balls of the invention can be of standard or enlarged size.

It has been found that multi-layer golf balls having inner and outer cover layers exhibit higher C.O.R. values and have greater travel distance in comparison with balls made from a single cover layer. In addition, it has been found that use of an inner cover layer constructed of a blend of low acid (i.e., 16 weight percent acid or less) ionomer resins produces softer compression and higher spin rates than inner cover layers constructed of high acid ionomer resins. Furthermore, it has been discovered that use of a softer polyurethane outer layer adds to the desirable "feel" and high spin rate while maintaining respectable resiliency. The soft outer layer allows the cover to deform more during impact and increases the area of contact between the club face and the cover, thereby imparting more spin on the ball. As a result, the soft polyurethane cover provides the ball with a balata-like feel and playability characteristics with improved distance and durability.

Consequently, the overall combination of the inner low acid ionomer resin cover layer and the outer cover layer made from polyurethane elastomers and non-ionomeric

resins results in a standard size or oversized golf ball having *enhanced resilience* (improved travel distance) and *durability* (i.e. cut resistance, etc.) characteristics while maintaining and in many instances, improving the balls playability properties. Specifically, it has been found that the combination of a low acid ionomer blend inner cover layer with a soft, relatively low modulus ionomer, polyurethane based elastomer outer cover layer provides for good overall coefficient of restitution (i.e., enhanced resilience) while at the same time demonstrating improved compression and spin. The outer cover layer generally contributes to a more desirable feel and spin, particularly at lower swing speeds with highly lofted clubs such as half wedge shots.

**VI. ISSUES (37 C.F.R. § 1.192(c)(6))**

Whether claims 1-6 are obvious and unpatentable under 35 U.S.C. §103 (a) over Proudfit (U.S. Patent No. 5,314,187).

**VII. GROUPING OF CLAIMS (37 C.F.R. § 1.192(c)(7))**

Claims 1-6 are directed to golf balls having a particular layered construction. Appellant submits that claims 1-6 should not stand or fall together but should be reviewed in the following groups:

Group I: Claims 1-4

Group II: Claim 5

Group III: Claim 6

Independent claim 1 (along with claims 2-4 which depend therefrom), recites, in part, a golf ball comprising an inner cover layer which is a blend of two or more low acid ionomer resins each of which contain no more than 16% by weight of an alpha, beta-

unsaturated carboxylic acid. The inner cover layer has a Shore D hardness of 60 or more. An outer cover layer having a hardness of 64 or less is molded on the inner cover layer and is comprised of non-ionomeric thermoplastic and thermosetting elastomers.

Independent claim 5 requires, in addition to the limitations of claim 1, that the golf balls have an inner layer with a modulus value of from about 15,000 to about 70,000 psi and a cover formed from a polyurethane based material.

In independent claim 6, modulus values for both the inner cover and outer cover are provided along with a list of specific materials from which the outer covers are made from including polyester elastomers, polyesters, polyether polyurethane, and polyester amides.

Because independent claims 1, 5, and 6 recite features not required by each of the other independent claims, it is submitted that these claims should not stand or fall together.

### **VIII. ARGUMENTS (37 C.F.R. § 1.192(c)(8))**

#### **I. The Examiner's rejection of claims 1-6 under 35 U.S.C. §103(a) as being obvious over Proudfit (U.S. Patent No. 5,314,187), is erroneous and must be reversed.**

The Examiner has rejected claims 1-6 under 35 U.S.C. §103(a) as being obvious over Proudfit (U.S. Patent No. 5,314,187). The basis for the rejection is as follows:

"Proudfit discloses the claimed invention with the exception of the particular Shore D hardness claimed. However, Proudfit discloses a hard inner cover and softer outer cover formed from materials such as those disclosed by the applicant. Obviously the exact hardness of the layers would have been up to the ordinarily skilled artisan depending on distance and feel considerations. Absent a showing of unexpected results, the particular parameters of Proudfit's ball, which is formed from

the same materials in the same fashion claimed by applicant, would have been obvious to one of ordinary skill in the art."

(Office Action of July 8, 1998, page 2).

Appellant is of the opinion that the Examiner has not addressed or has misinterpreted material limitations present in the claims. Specifically, with respect to the type of material used in the outer cover, the Examiner has failed to provide a teaching of the use of the particular comparatively softer non-ionomeric thermoplastic or thermosetting elastomers (claim 1) such as polyurethane (claim 5) or, polyesters, polyester elastomers, polyether polyurethane and polyester amides (claim 6).

More importantly, Appellant has submitted evidence in the form of a Declaration under 37 C.F.R. 1.131 (copy attached hereto as Attachment A) in a related application (U.S. Serial No. 08/926,246) which removes Proudfit ('187) patent as prior art by antedating the Proudfit ('187) patent. This Declaration has been held by the Examiner in the copending 08/926,246 application (who is the same Examiner in the present application) to be effective for antedating Proudfit ('187). Moreover, in an interview conducted on April 9, 1999, the Examiner indicated that such a Declaration, even though not timely in the present application, would be entered if it was found persuasive in the copending 08/926,246 application (see Interview Summary Record of April 9, 1999).

Even though Proudfit ('187) would not qualify as prior art upon submission of a similar Declaration under 37 C.F.R. §1.131 in the present application, Appellant also believes that Proudfit ('187) would have failed to render the claimed invention obvious to one of ordinary skill in the art at the time the instant invention was made.

#### The Prior Art

Proudfit teaches a two layer cover for a golf ball. The two layer cover comprises an inner layer which is molded over a solid or wound core and an outer layer which is molded over the inner layer. The inner layer is formed from a relatively hard, cut-resistant material such as ionomer resin, and the outer layer is formed from relatively soft material such as elastomeric or polymeric material selected from the class consisting of natural balata, synthetic balata, natural rubber, polybutadiene, and polyoctenylene rubber.

**The Claimed Invention Distinguishes Patentability  
and Unobviously Over the Cited Art**

The present invention, as claimed, requires an outer cover which is comprised of a relatively soft (compared to the inner cover) polymeric material selected from non-ionomeric thermoplastic and thermosetting elastomers (claim 1) polyurethane elastomer (claim 5) or polyester elastomers, polyesters, polyester polyurethane or polyester amides (claim 6).

Applicant respectfully submits that Proudfit fails to teach or suggest the claim designated outer cover compositions of the present invention.

Specifically, Proudfit, while disclosing a two layer cover comprising a relatively hard inner cover and relatively softer outer cover, fails to recognize the undesirable properties of a balata containing outer cover. As specifically set forth in the specification at page 2 of the specification:

"Despite all the benefits of balata, balata covered golf balls are easily cut and/or damaged if mis-hit. Golf balls produced with balata or balata-containing cover compositions therefore have a relatively short lifespan."

The present invention, utilizes the claim designated multi-layer cover which has an outer cover comprising non-ionomeric thermoplastic and thermosetting elastomers, such as polyurethane elastomers. Thus the present invention avoids the cut and abrasion propensities of balata while retaining the spin and feel characteristics of balata through the use of the claimed multi-layer structure.

Although the Examiner, in the Final rejection of December 21, 1998, has indicated that Proudfit does disclose outer cover layers of elastomers, including several thermoplastic or thermosetting non-ionomer polymeric elastomers, Appellants submit that Proudfit fails to recognize the advantages of the combination of a low-acid ionomer blend for the inner layer with the specifically claimed outer cover layer, wherein each of the outer layer and inner layer have claim specified Shore D hardness values (and in claims 5 and 6, specific modulus values). The Examiner readily admits that Proudfit fails to disclose the particular Shore D hardness values. In addition, the Appellant has shown unexpected properties from the claimed golf balls as set forth below.

As can be seen in Table 9 of the instant application (page 46), spin rates of the golf balls according to the present invention having softer polyurethane elastomer outer covers and harder inner covers (ball No.'s 23-25) are as high as, if not better than, comparable golf balls having Z-balata and/or soft ionomer resin covers and the same harder inner covers. However, as can be seen from Table 9, scuff resistance is better for the golf balls according to the present invention (scuff values of 1.5 for balls 23-25) compared to the Z-balata covered balls which have scuff values of 3 (for samples 27-29). This advantage is not taught nor suggested by the prior art.

In summary, the present invention relates to a multi-layer golf ball which has a hard, low acid, inner layer and a relatively soft, non-ionomeric elastomer such as a polyurethane, a polyester elastomer or by a polyester amide outer layer. As more particularly indicated in Example 4, use of non-ionomeric elastomers (Formulations 23-25) to produce the outer cover layer, results in molded golf balls having softer compression, improved durability, higher spin, with similar COR values to that of balata covered golf balls. The data indicates that a very good multi-layer ball having enhanced durability can be made using non-ionomeric elastomers (i.e., polyurethane, etc.) as the material for the outer cover layers.

Consequently, the applicant respectfully submits that the golf balls according to the claimed invention are not obvious variants of the Proudfit balls as Proudfit does not recognize or provide motivation for the unexpected enhanced durability of the claimed balls while retaining desirable balata-like properties.

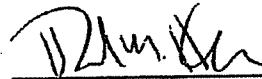
The Provisional Rejections

Upon allowance of claims 1-6, Applicant will submit one or more terminal disclosures as may be necessary in the two copending applications cited by the Examiner - U.S. Serial Nos. 08/920,070 and 08/926,246. At this time, no claims have been allowed in any copending application.

Accordingly, it is respectfully requested that the Examiner's rejections be reversed.

Respectfully submitted,

FAY, SHARPE, FAGAN,  
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P-3784-3-P1



UNITED STATES DEPARTMENT OF COMMERCE  
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Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/870,585 06/06/97 SULLIVAN M SLD-2-035-3-

QM12/1207

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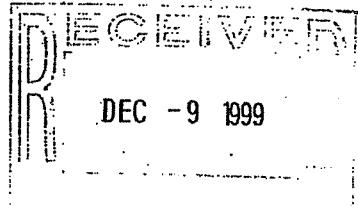
ART UNIT	PAPER NUMBER
3711	24

DATE MAILED:

12/07/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks



CCTR

<b>Office Action Summary</b>	Application No. <b>08/870,585</b>	Applicant(s) <b>Sullivan</b>
	Examiner <b>Mark S. Graham</b>	Group Art Unit <b>3711</b>

Responsive to communication(s) filed on Sep 20, 1999

This action is FINAL.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

#### Disposition of Claims

Claim(s) 1-6 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

Claim(s) 1-6 is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claims \_\_\_\_\_ are subject to restriction or election requirement.

#### Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All  Some\*  None of the CERTIFIED copies of the priority documents have been

received.

received in Application No. (Series Code/Serial Number) \_\_\_\_\_

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

#### Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Serial Number: 08/920,070

Page 2

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In view of the declaration under 37 CFR 1.131 included with the brief filed on 9/20/99, PROSECUTION IS HEREBY REOPENED. A new grounds of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (a) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (b) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 1-6 are rejected under 35 U.S.C. § 103 as being unpatentable over Nesbitt in view of Nakamura. Nesbitt discloses the claimed invention with the exception of the particulars of the materials utilized. Nesbitt does make clear though that various suitable resins may be utilized. One of ordinary skill in the art would, in view of Nesbitt's disclosure, recognize that other materials known in the art could have been utilized in the invention so long as the cover comprised a harder inner layer of Shore D hardness of 60 with a softer outer layer. As disclosed

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Page 3

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by Nakamura the use of hard materials such as that claimed for the inner cover layer is known in the art. With regard to claims 1-4 Nakamura also indicates that these materials may be formed as blends, (See Col. 2). It would have been obvious to one of ordinary skill in the art to have utilized such known materials which are of the class sought by Nesbitt in the manufacture of Nesbitt's ball absent a showing of unexpected results, (Claims 1, 4, 5, 6).

Regarding claims 2 and 3, note the examiner's comments in paper 2.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending Application No. 08/920,070. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: a golf ball with a hard inner and soft outer layer.

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Page 4

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Claims 1-6 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending Application No. 08/926,246. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: a golf ball with a hard inner and soft outer layer.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending applications. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Any inquiry concerning this communication should be directed to Mark S. Graham at telephone number (703) 308-1355.

MSG  
December 3, 1999

  
JEANETTE CHAPMAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700

Mark S. Graham  
Primary Examiner

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF : Michael J. Sullivan  
FOR : IMPROVED MULTI-LAYER  
GOLF BALL  
SERIAL NO. : 08/870,585  
FILED : June 6, 1997  
GROUP ART UNIT : 3711  
EXAMINER : M. Graham  
LAST OFFICE ACTION : December 7, 1999  
ATTORNEY DOCKET NO. : SLD 2 0035-3-3-1  
P-3724-2-F1

Cleveland, Ohio 44114-2518  
April 3, 2000

**AMENDMENT AND RESPONSE**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

In response to the Office Action mailed December 7, 1999, please amend the present application as follows.

**IN THE CLAIMS:**

Please amend claim 2 as follows:

2. (Twice Amended) A golf ball according to claim 1, wherein the inner cover layer has a thickness of about 0.100 to about 0.010 inches and the outer cover layer has a thickness of about 0.010 to about [0.70] 0.070 inches, the golf ball having the properties required by the U.S.G.A. and having an overall diameter of 1.680 inches or more.

**REMARKS**

In the Office Action mailed December 7, 1999, the Examiner reopened prosecution on the present application in view of applicant's Declaration Under 37 C.F.R. § 1.131 included with the Appeal Brief filed on September 20, 1999. The Examiner rejected claims 1-6 under 35 U.S.C. § 103 as obvious over U.S. Patent No. 4,431,193 to *Nesbitt* in view of U.S. Patent No. 5,068,151 to *Nakamura*. The Examiner then provisionally rejected claims 1-6 under the judicially created doctrine of double patenting over claims 1-8 of co-pending Application Serial No. 08/920,070 and claims 1-8 of co-pending Application Serial No. 08/926,246.

Applicant presents a clarifying amendment and remarks concerning the present application and submits that claims 1-6 are in condition for allowance.

**A. Rejection of Claims 1-6 Under 35 U.S.C. § 103 as Obvious Over *Nesbitt* in View of *Nakamura* Has Been Overcome**

The Examiner rejected claims 1-6 under 35 U.S.C. § 103 as obvious over U.S. Patent No. 4,431,193 to *Nesbitt* in view of U.S. Patent No. 5,068,151 to *Nakamura*. Specifically, the Examiner stated that:

Claims 1-6 are rejected under 35 U.S.C. § 103 as being unpatentable over *Nesbitt* in view of *Nakamura*. *Nesbitt* discloses the claimed invention with the exception of the particulars of the materials utilized. *Nesbitt* does make clear though that various suitable resins may be utilized. One of ordinary skill in the art would, in view of *Nesbitt*'s disclosure, recognize that other materials known in the art could have been utilized in the invention so long as the cover comprised a harder inner layer of Shore D hardness of 60 with a softer outer layer. As disclosed by *Nakamura* the use of hard materials such as that claimed for the inner cover layer is known in the art. With regard to claims 1-4 *Nakamura* also indicates that these materials may be formed as blends, (See Col. 2). It would have been obvious to one of ordinary skill in the art to have utilized such known materials which are of the class sought by *Nesbitt* in the manufacture of *Nesbitt*'s ball absent a showing of unexpected results, (Claims 1, 4, 5, 6).

Regarding claims 2 and 3, note the examiner's comments in paper 2.

(Office Action, pp. 2-3).

**1. Examiner Ignores the Fact that *Nesbitt* Teaches the Use of a Low Acid Ionomer**

First, the Examiner contends that *Nakamura* teaches specific types of hard materials that *Nesbitt*, in the '193 patent, teaches should be used in manufacturing a golf ball.

However, a closer reading of that patent reveals that *Nesbitt* continues and discloses that in producing a multi-layer golf ball, a first interior layer that is formed about a spherical core, is comprised of a hard, high flexural modulus resinous material such as type 1605 Surlyn® (now designated Surlyn® 8940), col. 2, lines 34-39.

The Examiner ignores the fact that this is a low acid ionomer resin. Thus, in point of fact, *Nesbitt* teaches the use of a low acid ionomer resin for an interior mantle layer, which is directly contrary to a claimed feature of the present invention golf balls, i.e. that a high acid ionomer be used in such layers. Thus, *Nesbitt* actually teaches away from the claimed invention.

**2. *Nakamura* Does Not Distinguish Between High Acid and Low Acid**

Notwithstanding the previously noted defect, the Examiner's rejection is also flawed. The Examiner states in the Office Action that "[a] disclosed by *Nakamura* the use of hard materials such as that claimed for the inner cover layer is known in the art." (Office Action, pp. 2-3).

According to the present application and as generally understood in the industry, a "high acid ionomer" would not include an ionomer including 10%, or for that matter, 10% to 15%, by weight of an alpha, beta-unsaturated carboxylic acid. A "high acid ionomer" as that term is used in the industry, refers to an ionomer that contains greater than about 16% by weight of a carboxylic acid. This was the specific definition of "high acid ionomer" provided in the present application (see page 12 of the specification).

Furthermore, the Examiner's statement, or rather view as to what *Nakamura* teaches, actually supports the view that *Nakamura* does not distinguish between high acid ionomers and low acid ionomers. *Nakamura* fails

to disclose any advantage of using high acid resins (i.e. >16% acid) versus low acid resins. In fact, *Nakamura* does not distinguish high acid ionomers from low acid ionomers since *Nakamura* merely describes such ionomers as containing from 5% to 20%, thereby treating them as equivalent to one another.

As previously noted, since *Nesbitt* teaches the use of a low acid ionomer, one would not be motivated to refer to a reference describing high acid ionomers. If the *Nakamura* patent were magically placed before a formulator, in combination with the *Nesbitt* patent, the *Nakamura* patent still fails to teach the use of a high acid ionomer instead of a low acid ionomer since it treats both as equivalents to one another. Simply put, there is no motivation provided by these patents to utilize a high acid ionomer in an inner layer of a golf ball. For at least these reasons, the Examiner's reliance upon the '151 patent to *Nakamura* is misplaced.

### 3. *Nakamura* Does Not Teach the Use of a "High Acid Ionomer"

*Nakamura* generally relates to the use of a low acid ionomer, as opposed to high acid, to produce the outer cover layer of a golf ball. *Nakamura* briefly suggests that the acid content of the ionomer resin utilized may be of 5% or 10% to 20% by weight. *Nakamura* fails to disclose any advantage of using high acid resins, i.e. greater than 16% acid, versus low acid resins. In fact, no Example of *Nakamura* uses greater than 15% acid.

The claimed material, i.e. "a high acid ionomer including at least 16% by weight of an alpha, beta-unsaturated carboxylic acid" is not as the Examiner contends, "recited throughout the patent." The Examiner is confusing the specifically claimed material with the very broad class of materials of ionomers containing 10 to 20% by weight acid. As previously explained, *Nakamura* does not distinguish between high acid ionomers from low acid ionomers, but instead treats them as equivalents.

**4. Mischaracterization of Statement that High Acid Ionomer Resins Were Not Commercially Available Prior to January, 1992**

In explaining that *Nakamura* does not distinguish between the class of ionomers now known as low acid ionomers from the class of ionomers now known as high acid ionomers, Applicant noted that high acid ionomer resins were not generally commercially available prior to January 1992. Applicant brought this to the Examiner's attention since it further demonstrates that *Nakamura* cannot be read as distinguishing low acid ionomers from high acid ionomers, since at the time of filing the application which matured into the *Nakamura* patent<sup>1</sup>, the golfing industry and marketplace were not particularly aware of the differences between the performance and properties resulting from such resins. As a matter of fact, the golfing industry later learned that high acid ionomers produced significant durability problems when utilized in golf ball construction.

**5. Examiner's Reasons for Rejecting Remaining Claims are Deficient**

Turning attention to the specific rejection of claims 2 and 3, the Examiner argued that "it would have been obvious to one skilled in the art to have increased the thicknesses of Nesbitt's layers to increase the durability of the ball."

It is respectfully submitted that the Examiner's reading of these claims is oversimplified and ignores the fact that they recite particular aspects of the invention in combination with features in claim 1, from which each of these claims depend.

Claims 2 and 3 are both dependent from independent claim 1 and so, contain all of the recitations of that claim. In addition, these claims recite additional aspects pertaining to particular thickness ranges for the inner and outer cover layers. Claim 2 recites that the inner cover layer has a thickness of about 0.100 to about 0.010 inches and the outer cover layer has a thickness of

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<sup>1</sup>The U.S. application was filed on February 2, 1990, and the Japanese parent patent was filed on February 6, 1989.

about 0.010 to about 0.07 inches. This particular combination of thickness ranges for the covers, particularly when taken in combination with the high acid ionomer aspect of the inner cover layer defined in claim 1, is simply not described or suggested in the *Nesbitt* and *Nakamura* patents. Similarly, claim 3 recites a unique combination of specific thicknesses for the inner cover layer and outer cover layer – the inner cover layer has a thickness of about 0.050 inches and the outer cover layer has a thickness of about 0.055 inches – which is not taught or suggested in the patents to *Nesbitt* and *Nakamura*. This particular aspect, especially when taken in combination with the other previously described aspects called out in claim 1, is in no way described in the cited references. For at least these reasons, claims 2 and 3 are nonobvious and patentable over the cited art.

Claim 5 recites a multi-layer golf ball comprising a spherical core, an inner cover layer molded over the core, and an outer cover layer molded over the spherical intermediate ball to form a multi-layer golf ball. The inner cover layer is recited as including at least 16% by weight of an alpha, beta-unsaturated carboxylic acid. As previously noted, *Nesbitt* entirely fails to disclose or even suggest incorporating a high acid ionomeric resin in an inner cover layer. And, *Nakamura* fails to disclose or even remotely suggest the use of hard, high acid ionomer resins to formulate the inner cover.

In addition, claim 5 further specifically recites that the particular ionomeric resin utilized in the inner cover layer have a modulus of from about 15,000 to about 70,000 psi. Neither *Nakamura* nor *Nesbitt*, taken singularly or in combination, teach, describe, or suggest this aspect. Accordingly, the unique combination of these aspects of the inner cover layer, i.e., that it comprise at least 16% of an alpha, beta-unsaturated carboxylic acid, and that it comprise a certain ionomeric resin having a particular modulus, is not taught in either of the patents cited by the Examiner.

Claim 6 recites a multi-layer golf ball comprising a spherical core, an inner cover layer, and an outer cover layer. Claim 6 calls for the inner cover layer to comprise an ionomeric resin having no more than 16% by weight of an alpha, beta-unsaturated carboxylic acid. Claim 6 further calls for the particular

ionomeric resin to have a modulus of from about 15,000 psi to about 70,000 psi. This aspect is not described in either the *Nakamura* or *Nesbitt* patents. The combination of this aspect and the particular proportion of the certain ionomeric resin called for in claim 6 is not described in the *Nakamura* or *Nesbitt* patents.

Claim 6 also recites that the outer cover layer comprises a specific type of non-ionomeric thermoplastic selected from a group of polyester elastomer, polyester polyurethane and polyester amide. Claim 6 additionally recites that the outer cover layer have a modulus in the range of from about 1,000 to about 30,000 psi. Again, there is no mention in either of the two references relied upon by the Examiner of an outer cover layer comprising one or more of these types of non-ionomeric thermoplastics, having a modulus within this recited range, in combination with an inner cover layer that comprises an ionomeric resin that includes a certain amount of an alpha, beta-unsaturated carboxylic acid and that has a specific modulus. It simply cannot be said that claim 6 recites obvious subject matter.

#### **6. The Commercial Success of the Claimed Golf Balls Warrants Patentability**

The claimed golf balls of the present application have achieved enormous commercial success. (Exhibits 1-25). Particularly, the claimed golf balls of the present application have already been used by golfers on the Professional Golf Association Tour to win numerous tournaments, including the Masters Tournament and the British Open, shortly after its introduction. (Exhibits 19, 21-23).

More importantly, the claimed golf balls of the present application have become the most popular multi-layered golf ball played by golfers on the Professional Golf Association Tour. (Exhibit 20). Hundreds of Tour professionals worldwide have begun using the claimed golf ball since its introduction. (Exhibits 24-25).

Clearly, the claimed golf balls are distinguishable from the Examiner's cited references as the particular features recited form a golf ball which has achieved unmarkable success since its inception.

**B. The Provisional Obviousness Type Double Patenting Rejections**

Upon allowance of claims 1-6, Applicant will submit one or more terminal disclaimers as may be necessary in the two co-pending applications cited by the Examiner, U.S. Application Serial Nos. 08/920,070 and 08/926,246.

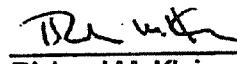
**CONCLUSION**

In view of the foregoing, applicant respectfully submits that claims 1-6 are in condition for allowance. Applicant respectfully requests early notification of such allowance.

Respectfully submitted,

FAY, SHARPE, FAGAN,  
MINNICH & MCKEE, LLP

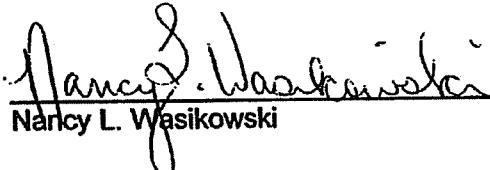
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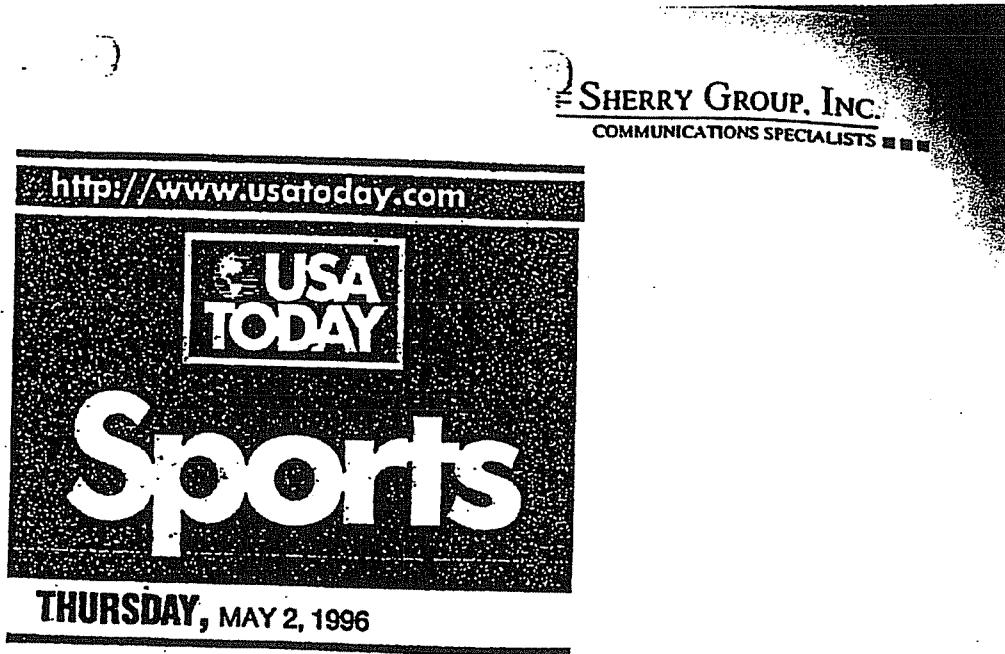
**CERTIFICATE OF MAILING**

I hereby certify that this AMENDMENT AND RESPONSE in connection with U.S. Patent Application Serial No. 08/870,585 is being deposited with the United States Postal Service as first-class mail, postage prepaid, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on this 3<sup>rd</sup> day of April, 2000.

By:

  
Nancy L. Wasikowski

**CW 0300466**



## Top-Flite will sell multilayer golf ball

By Don Cronin  
USA TODAY

Golfers no longer must choose only between wound or two-piece golf balls.

Top-Flite soon will market a multilayer ball it says combines the best of both.

"When I'm pitching or putting the ball reacts very softly, like a wound ball," says Mark O'Meara, who used the ball finishing second April 21 at Hilton Head Island, S.C., and winning Sunday at Greensboro, N.C., to earn \$475,200 the last two weeks on the PGA Tour.

"When I hit it off the tee, it feels harder. When it hits the ground, it rolls farther."

Spalding, Top-Flite's parent company, patented multilayer golf ball construction in 1984.

"But not until the last cou-

ple of years were we able to put it all together," said Mike Sullivan, Top-Flite's senior director of research.

"This ball does things neither a wound nor a two-piece ball can do. It has the feel of a wound ball — high spin on short shots with lofted irons — but the distance of a two-piece ball off the tee.

"We call it a 'spin on demand' product."

This model, at \$35 a dozen, is designed for pros and low-handicap amateurs, but models for higher handicap players will follow.

"We can use multilayer construction to customize balls for players of all skill levels," said Scott Creelman, senior vice president of golf products.

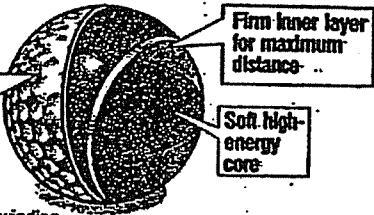
► Ball comparisons, 14C

## Top-Flite's layered look

Combining the qualities of wound and two-piece golf balls, Top-Flite is introducing a new ball. The multi-layer ZS Balata covered ball is designed to deliver superior distance, unequalled spin control and the feel of a soft cover.

### ZS BALATA

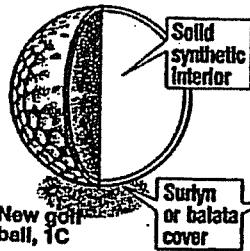
Super-soft ZS balata cover for highest spin



Firm outer layer for maximum distance

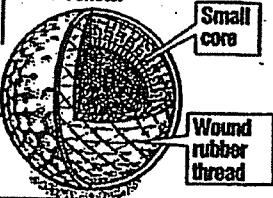
Soft high-energy core

The two-piece ball has no small core or winding. The interior is a solid synthetic material. The cover usually is surlyn or some other synthetic, difficult-to-cut material.



New golf ball, 1C

The three-piece ball has a small spherical core that is solid, or hollow and filled with fluid. Around the core is wound about 40 yards of rubber band. The cover is surlyn or balata. Surlyn is a tough cover; balata cuts more easily on mis-hit shots.



2

**CW 0300468**

CHERRY GROUP, INC.  
COMMUNICATIONS SPECIALISTS

# GOLF WEEK

May 18, 1996

## PERSPECTIVE

### Balls with 2-speed transmission too smart

I had a dream the other night. I was playing in the U.S. Open and — are you ready for this? — I was talking to my golf ball.

"Launch angle, 31 degrees," I was saying as I stood on the tee. "Backspin, minimal. Sidespin, none. Initial velocity, 255 feet per second. Total distance, 296 yards."

*Kaboom!* My ball exploded off the clubface, accelerated powerfully through its take-off and landed flawlessly in the fairway.

"That new ball from Nike called the Talking Brain," Johnny Miller was explaining to a worldwide television audience. "Nike has been remarkably aggressive since acquiring Spalding and its Top-Flite line. This new ball does whatever you tell it to do — within the rules, of course. It's kind of expensive, though. A dozen costs \$2,400 at Montana Bob's."

I woke up before I won the U.S. Open, but it was inevitable.

What's up with golf balls, anyway? All of a sudden, we are hearing about four-piece balls and double-cover balls (Bridgestone) and multilayer balls (Top-Flite). Players like Nick Faldo and Mark O'Meara are using them to win tournaments, but they aren't yet available to you and me. Top-Flite hasn't even announced a name for its ball.

At least Titleist was ready with a large supply of the two-piece HP2 Tour once the new ball started making headlines earlier this year. Consumers didn't have to wait.

But let's give Bridgestone and Spalding a break. They didn't expect us to beat down their doors, demanding to play a ball before its scheduled release. But we, the golfers of America, seem to be ravenous for anything new.

Earlier this month I had a luncheon meeting with Hank Rojas, president of Bridgestone. I

asked him what I thought were the obvious questions. "How in the world can a ball have two covers? When can we purchase the ball that Faldo used to win the Masters?"

The answer to the second

**JAMES ACHENBACH**

question is clear: before the end of the year. Bridgestone appears to have blown this one, because the curiosity and demand are here, thanks to Faldo, but the ball isn't. It is sold only in Japan.

When it comes to golf balls in Japan, Bridgestone and Dunlop are the Big 2 — the Titleist and Top-Flite of Japanese golf, if you will. Bridgestone, with 6 percent of the U.S. golf ball market, controls about 40 percent of Japanese ball sales.

What about this double-cover mumbo jumbo? It's a convenient way to describe a ball, even if it isn't accurate. The new Bridgestone ball, which will be called Precept Tour in this country, has a cover stock on the outside and a second layer of rigid, undimpled material on the inside (this is also true of the new Top-Flite ball).

The Precept Tour has a solid center surrounded by windings. Add the cover and the interior layer and — whammo — there are four pieces.

The Top-Flite ball, used by O'Meara to win the Greater Greensboro Chrysler Classic, has three pieces. There is the solid core, plus the cover and inner layer. The ball should be available in July.

According to the tour players who have used them, both balls have a soft, balata-like

feel. Both will be promoted with a story that sounds too good to be true — less spin off the driver, more spin with the short irons. How can this be?

I called Rick Watson, director of golf ball marketing for Top-Flite, and got what might be the quote of the year: "It's like a golf ball with a two-speed transmission."

I know, I know. What if your game gets stuck in first gear?

"From 100 yards and in," said Watson, "where better players tell you they need the balls to kick in for them, the soft cover gets pinched against the inner layer and creates a high spin rate."

Hmmm.

The idea here is to produce optimum distance and feel — the best of both worlds — and still adhere to the distance and velocity limits of the U.S. Golf Association (both new balls already have been approved by the USGA). "We're getting closer to the perfect golf ball," Watson said.

Which doesn't mean that tour players will switch en masse to the new balls. Nick Price and Raymond Floyd will continue to use the Precept EV Extra Spin, and Craig Stadler and Payne Stewart will stay with the Top-Flite Z-Balata. According to Watson, the new Top-Flite ball has a slightly lower trajectory than the Z-Balata.

The new balls from both companies probably will carry a discounted street price of about \$40 a dozen.

All this, of course, is a prelude to the Talking Brain. We have seen the future, and it is very smart. Too smart, if you ask me.



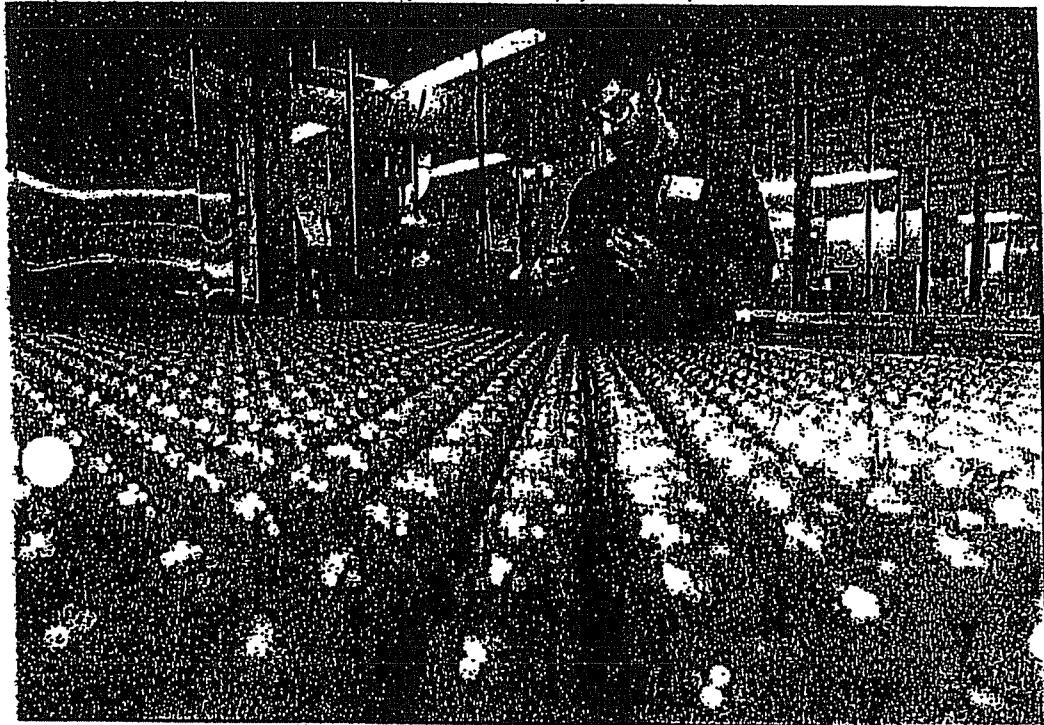


THE SHERRY GROUP INC.  
COMMUNICATIONS SPECIALISTS NEW YORK

## UNION-NEWS

JUNE 4, 1996

### *laving a ball*



Union-News file photo by JOHN SUCHOCKI

» Henriquez inspects golf balls as they leave the curing oven last fall at Spalding Sports Worldwide in Chicopee. Spalding yesterday announced plans to expand golf ball production by 40 percent at its two golf ball plants.

## Spalding speeds up expansion plan

and for its new golf ball — Top-Flite Strata — has sped up the timetable for expansion by Spalding Sports Worldwide.

By BILL ZAJAC  
*Staff writer*

CHICOPEE — A multi-million-dollar, three-year expansion that will increase golf production by 40 percent in

its two plants was announced yesterday by Spalding Sports Worldwide.

The plans for expansion are being accelerated by the company because of the overwhelming success of a revolutionary new ball that Spalding introduced

two weeks ago to the public. The expansion was to begin in January 1997, but it will begin next month instead because of the demand for Spalding's Top-Flite Strata.

The new, multi-layered ball was to be introduced next week at the U.S. Open, but questions about it arose within the golf industry when PGA Tour player Mark O'Meara won the Greater Greensboro Chrysler Classic April 28.

At the time, Spalding released some information on the ball but wouldn't reveal its name until its introduction.

The demand for the ball is so great that Spalding is limiting quantities it ships to customers. Customers are limited to receiving six dozen balls per month.

"We can't make these balls fast enough," said Michael Brissette, vice president of manufac-

Please see Spalding, Page B11

THE SHERRY GROUP, INC.  
COMMUNICATIONS SPECIALISTS

## UNION-NEWS

JUNE 4, 1996

# Spalding: New golf ball a big hit

Continued from Page A1

turing/procurement.

The ball's construction is designed to give the golfer more distance and more control.

Spalding officials wouldn't comment on an exact dollar figure for the expansion or how many jobs will be created as a result.

"Top-Flite's worldwide market share is continuing to grow. This expansion is necessary to support our growth and, in particular, our exciting new multi-layered technology," said Scott Creelman, senior vice president of golf products worldwide.

The increase in production capacity will be spread over Spalding's Chicopee and Gloversville, N.Y. plants. However, what proportion of the 40 percent increase will take place at each plant has not been determined as Spalding officials rush to complete plans.

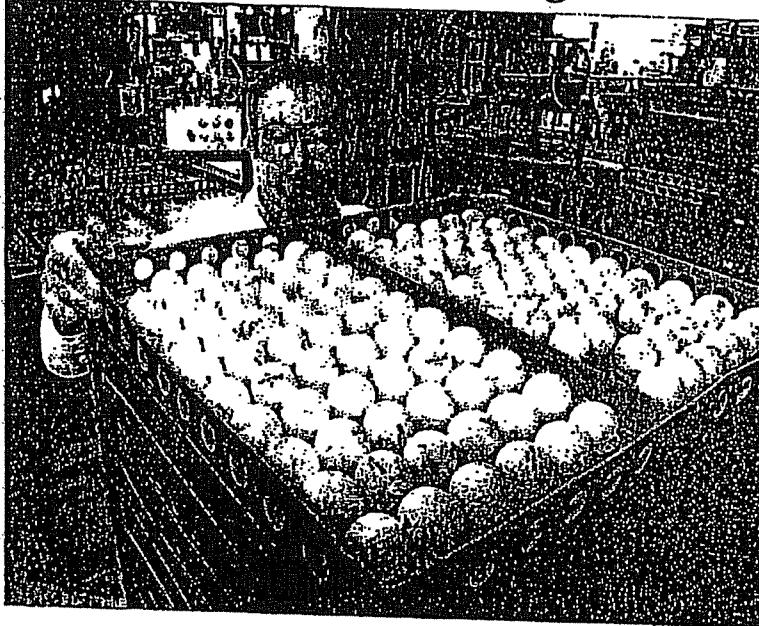
"It depends on the growth of the whole golf products family and what products we intend to grow," said Bribolos.

Each plant is expected to be expanded by about 25,000 square feet. The Chicopee plant, which includes offices, manufacturing and warehousing, is currently 700,000 square feet. The Chicopee plant has a 1,000-person workforce, 600 of whom are production workers.

The Gloversville plant is 116,000 square feet and employs 180 people.

Meanwhile, Spalding remains on the selling block. Parent company The Cimexos Group of Venezuela announced last month that it was selling its Spalding and Evenflo divisions to concentrate on its telecommunications business. The sale is expected to be a six-to-nine-month process.

Spalding, which markets its golf balls under the Top-Flite brand name, is the self-proclaimed No. 1 golf ball manufacturer in the world. Its \$1 million golf ball challenge, which offered



Union-News photo  
Spalding employee Avelino Santos stacks a batch of golf balls at the company's Chicopee plant. The company yesterday announced a three-year expansion project that will increase golf ball production by 40 percent at the company's two golf ball plants.

\$1 million to any company that could prove it sells more balls than Spalding, went unchallenged.

Spalding believes that the 25 million dozen golf balls it sells annually represents 33 percent of the world's golf ball market. Spalding's share of the golf ball market has been growing at a pace in which it believes it can own 50 percent of the world market by 2000.

The three-year expansion plan was designed based upon growth rate before the introduction of the Top-Flite Strata.

"This will probably be one of the most successful products that Spalding has ever launched," said Vaughn Rist, a Spalding spokesman. The Strata introduced a new ball construction in the golf ball industry with its three layers. Golf balls have been a two-layer unit with a core and a covering. The Strata ball has a large, soft high-energy core that is surrounded by a hard middle layer that Spalding claims adds distance.

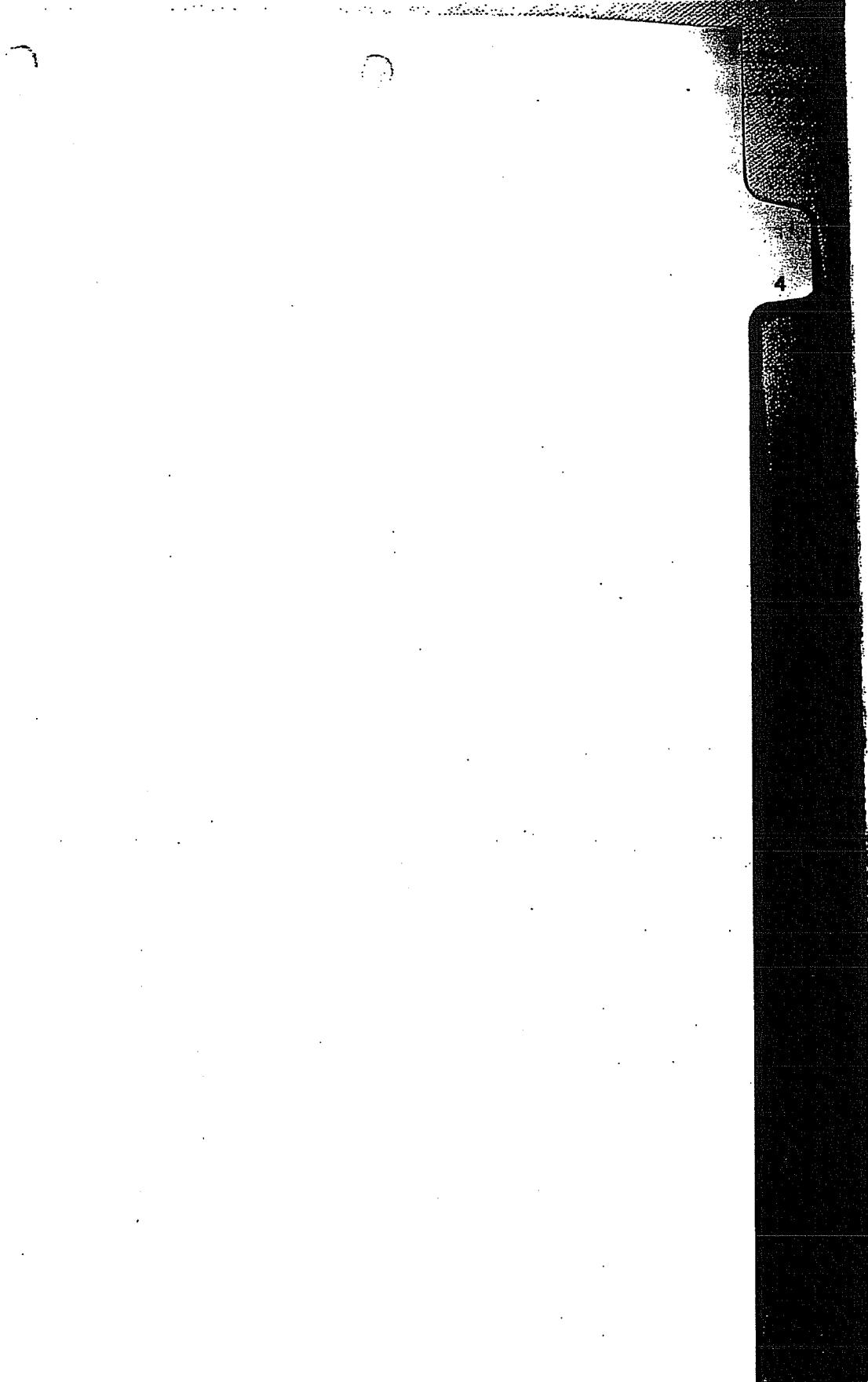
The outermost covering is made of a soft balata material

that is designed to generate spin.

In the two-layer construction, the covering materials are varied to give the ball different playing qualities. Hard covers provide more distance and less control. Soft coverings provide more control less distance.

Strata's construction combined both control and distance, according to Spalding officials.

The Chicopee plant manufacturers an average of 72,000 golf balls per day and operates its production three shifts per day six days a week.



CW 0300473

SHERRY GROUP, INC.  
COMMUNICATIONS SPECIALISTS

# SCHENECTADY GAZETTE

JUNE 5, 1996

## Spalding factory to grow

By JIM MCGUIRE  
*Gazette Reporter*

**GLOVERSVILLE** — Spalding Sports Worldwide will expand its Gloversville golf ball factory to produce its new Top-Flite Strata ball.

The project was presented Tuesday to the Fulton County Industrial Development Agency, which voted to sell Spalding over five acres adjacent to the existing 34,440-square-foot plant in Crossroads Industrial Park.

The 19,000-to 25,000-square-foot expansion, scheduled for completion in December, will cost about \$1.5 million and will create more than 30 new jobs, the IDA board was told. Spalding, which also operates a golf club manufacturing plant next to the golf ball factory, currently employs a total of 147 people.

Spalding Worldwide Sports, owned by The Cisneros Group of Venezuela, is for sale. But Fulton County economic development officials said they were told the possible sale will not affect the Gloversville expansion project.

Staffing levels at Spalding in Gloversville have exceeded 200 with seasonal work fluctuations, said Peter A. Sciochetti, vice president for marketing of the Fulton County Economic Development Corp.

Sciochetti said Spalding is investing millions of dollars above the cost of construction in the installation of two new production lines for its Strata ball and replacement of the existing three production lines for its other Top-Flite models.

"They [Spalding officials] think this new ball is going to be state of the art," Sciochetti said. Construction is scheduled to start in early July, he said.

Spalding executives could not be reached Tuesday for comment, but a news release issued by the company described the multilayer Strata as a "breakthrough technology" that will create "extraordinary demand" and the need for a "major multimillion dollar expansion of production capacity."

The Gloversville expansion is part of a three-year program designed to increase production by 40 percent, the news release said. A 25,000-square-foot addition will be built in Chicopee, Mass., its headquarters, but Sciochetti said all Strata production will take place in Gloversville.

Spalding, which opened its first factory in Gloversville in 1988, has held an option to buy the additional land for \$10,000 per acre. That deal was authorized Tuesday by the IDA board.

The addition will be built on the west side of the existing plant. Sciochetti said Spalding may have more than 230 employees in Gloversville in the near future.



 **SHERRY GROUP, INC.**  
COMMUNICATIONS SPECIALISTS

# GOLF WEEK

JUNE 8, 1996

## Top-Flite to unveil Strata ball June 11

Spalding's Top-Flite division will officially unveil its new multilayer ball June 11. The new ball, called the Strata, has a soft outer cover for spin and control, and a hard inner layer to promote distance. Suggested retail will be \$52 per dozen. PGA Tour pro Mark O'Meara has been playing the ball since April.

Rick Watson, Top-Flite's golf ball marketing director, said Top-Flite has had a patent on a multilayer ball since 1984. "We were very patient in bringing out the product," he said, citing more than a decade of product development.





# AVALANCHE-JOURNAL

JUNE 12, 1996

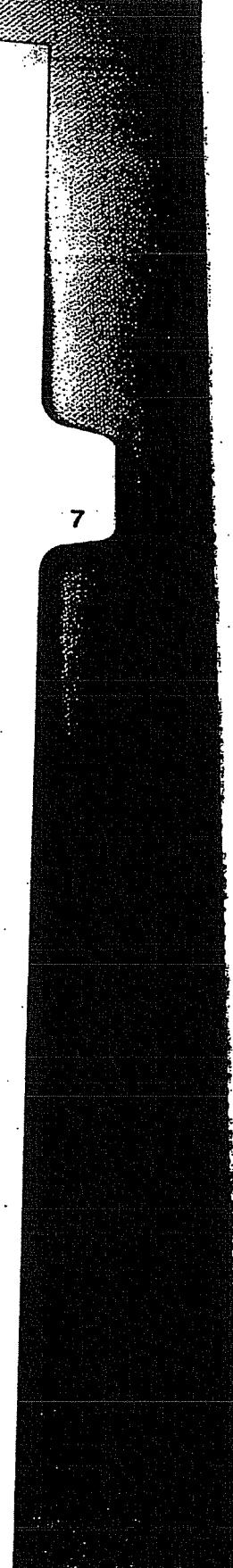
## U.S. Open notes

■ Spalding is using the U.S. Open to begin marketing a new golf ball. But the multi-layer Top-Flight Strata Tour already had quite a launch before the launch, so to speak. . . .

Touring pro Mark O'Meara has been using the ball for several weeks.

In that time, O'Meara has won the Greater Greensboro and Memorial tournaments, finishing second at the MCI Heritage and Kemper Open. O'Meara is \$678,600 richer and 51-under-par since he began playing the ball.

According to Spalding, the multi-layer design of the ball — designed for pros and top-level amateurs — combines a soft Balata cover with a firm inner layer and high-energy core. But it isn't cheap. The suggested retail price is \$52 per dozen.



**CW 0300479**

SHERRY GROUP, INC.  
COMMUNICATIONS SPECIALISTS ■■■

# BOSTON GLOBE

JUNE 20, 1996



**GOLF BALL** numbers for you to digest over morning coffee. According to Associated Press, the range at the US Open was stocked daily with 686 dozen Titleists, 300 dozen maxflis and 100 dozen Top-Elite Stratus. Workers at the range said each of 10 sweeps made daily picked up some 200 dozen golf balls, meaning 240,000 balls were struck daily. And who was the best customer? Tiger Woods reportedly hit more than 400 balls on each visit.



SHERRY GROUP, INC.  
COMMUNICATIONS SPECIALISTS

# ATLANTA BUSINESS CHRONICLE

JUNE 20, 1996

## New generation

The two-camp world of golf balls — those who prefer wound balls and those who prefer two-piece — may be coming to an end. Top-Flite soon will market a multilayer ball it says will combine the best of both worlds.

Spalding, Top-Flite's parent company, patented multi-layer golf ball construction in 1984.

"But not until the last couple of years were we able to put it all together," says Mike Sullivan, senior director of research at Top-Flite. "This ball does things neither a wound nor a two-piece ball can do. It has the feel of a wound ball — but the distance of a two-piece ball off the tee.

"We call it a 'spin on demand' product."

This model, at \$35 a dozen, is designed for pros and low-handicap amateurs, but models for higher-handicap players will follow.



THE SHERRY GROUP, INC.  
COMMUNICATIONS SPECIALISTS

# BUSINESS REVIEW

JUNE 30, 1996

## Emerging technology for multi-layer golf balls drives expansion of Gloversville Spalding plant

By MICHAEL FARRELL

Spalding Sports Worldwide Inc. plans to build a 25,000-square-foot addition to a facility in Crossroads Industrial Park in Gloversville.

The company already has a 34,440-square-foot golf ball factory in the park, as well as an 80,000-square-foot plant that makes golf clubs. The addition is being proposed to accommodate production of a new multi-layer golf ball called the Top-Flite Strata. The addition will cost about \$1.5 million, with construction expected to begin in July.

"Top-Flite's worldwide market share continues to grow," Scott Creelman, senior vice president for golf products worldwide, said in a prepared release. "This expansion is necessary to support our growth and, in particular, our exciting new multi-layer technology."

The three-year expansion plan—which also includes a 25,000-square-foot addition to

the company's manufacturing and headquarters facility in Chicopee, Mass.—is expected to increase existing capacity by 40 percent.

Spalding Sports also will invest millions more to revamp production lines and purchase new equipment for the Gloversville plant. When the local building is completed in December, it will be the only Spalding factory manufacturing the Strata line.

"Spalding's presence in our community continues to grow with undaunting commitment," Jeffrey Bray, executive vice president of the Fulton County Economic Development Corp., said in a prepared release. "Spalding's continued expansion speaks volumes regarding the ability to do business in Fulton County."

Spalding already employs about 200 seasonal workers at the Gloversville factories. The company expects to hire an additional 30 people after the addition is completed.

10

**CW 0300485**

SHERRY GROUP, INC.  
COMMUNICATIONS SPECIALISTS 222

# REGISTER CITIZEN

TORRINGTON, CT

JULY 21, 1996

## New clubs, ball add distance, control

**L**ooking to smack the ball a little farther? Want to make the ball dance for you around or on the green?

Apparently so, because two of the more popular innovations in golf equipment these days can help you do both.

For those who want that John Daly feeling off the tee, titanium head drivers have become the club to have. And for those who want that Corey Pavin touch with the ball, a new ball, the Spalding Strata, is the hot thing.

"Titanium is in, in a big way. It's supposed to be stronger than steel and lighter," Green Woods Country Club pro Dave Dell said.

"People really into the game are always in search of the ultimate," Torrington Country Club pro Tom Lavinio said. "And they're buying it. You can hit the ball further with it."

As for the ball, Spalding's latest is constructed differently and can be made to behave a lot like a balata ball, allowing the use of backspin, among other things.

"It has a better cover," Lavinio said. "It's softer and players are looking for a soft cover because it gives them more control. The hard cover balls just don't do what you want them to some times."

The titanium drivers are lighter than a normal driver, but stronger. Therefore the heads can be made bigger with a bigger sweet spot. The idea is to be able to bring the head through

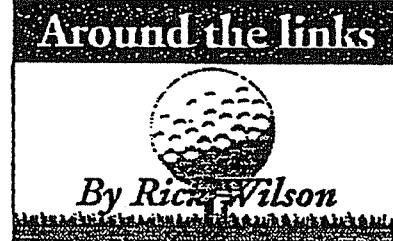
compresses, allowing the ball to be hit further.

Around the green on a delicate shot, the club just hits the outside cover, allowing for a lot of spin and control.

"I was using a Titleist Tour and I switched," Lavinio said. "My tee shot goes 10-15 yards further and the ball is very good around the green."

The Strata is not cheap. A sleeve of three balls cost between \$10-15 while a dozen can go from \$40 to \$55.

"Usually you can get them in most pro shops, but they are hard to get," Dell said. "(The companies) can't keep up with the demand."



faster and hit the ball further.

"All the major manufacturers – Taylor Made, Big Bertha (Callaway), etc. – have stainless steel oversized heads and titanium heads," Dell said. "You have to make sure that you don't get a copycat. A lot of companies are using a titanium alloy and selling the club for a cheaper price. There's no question it is inferior."

Will the titanium head improve your game? Probably. But for the average golfer, more practice on the swing instead of worrying about what's being swung may be the answer.

"(The average golfer) might see a slight improvement," Dell said. "But, it just makes the game a little more fun. It makes the equipment a little more exciting to use."

Titanium head drivers are running from \$250-\$400, making it hard for the average golfer to buy one, anyway.

Spalding's new ball has two covers, an inner hard one and a softer outer one, unlike a regular ball which has a core and a molded cover on it. When you hit the ball hard, the outer cover



THE SHERRY GROUP, INC.  
COMMUNICATIONS SPECIALISTS

# BusinessWeek

JULY 29, 1996

A PUBLICATION OF THE MCGRAW-HILL COMPANIES

\$3.50

## PRODUCT PEEK

### THE BELLE OF THE GOLF BALLS

THEY'RE FLYING OFF THE shelves as fast as they are off the tee. At \$3 each, Top-Flite's new Strata balls, which appeared in June, cost



**\$3 APIECE: But sales are brisk**

three times as much as regular golf balls. Still, pro shops are hard put to keep them in stock.

Spalding-owned Top-Flite hopes the Strata's popularity will boost the company's No. 2 market share in high-end balls from 20% to 30% by next summer, overtaking leader Titleist. Used by pros and low-handicap golfers, the hardy balls are one-third of the \$602 million golf-ball



**EQUIPMENT****GOLF  
DIGEST**

SHERRY GROUP, INC.

COMMUNICATIONS SPECIALISTS

**Double covers, multiple layers enter the ball market**

**C**ould this be a trend? Mark O'Meara wins twice on the PGA Tour with two different golf balls. O'Meara plays a wound, three-piece Titleist Tour Balata to win the season-opening Mercedes Championship and 16 weeks later wins the Greater Greensboro Chrysler Classic using Top-Flite's new Strata Tour, a three-piece, solid-core ball made with what the company calls "multi-layer technology."

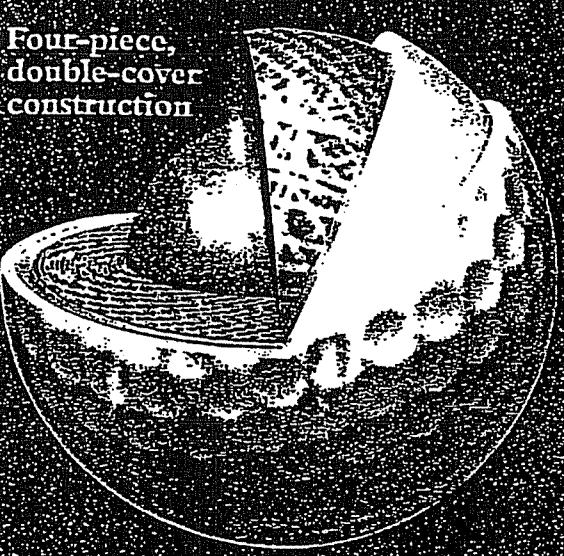
Corey Pavin won the 1995 U.S. Open with a Titleist Tour Balata and then added a victory several months later at the Nedbank Million Dollar Challenge in South Africa playing Titleist's new two-piece ball, the HP2 Tour.

What gives here? Are golf balls so similar that the top players in the world can win from week to week using different models?

"You had huge trade-offs between balls before," says Hank Rojas, the president of Bridgestone, one of the game's major ball manufacturers. "Now the trade-offs are not quite as big."

The various balls played by 1996 PGA Tour winners emphasize this broadening of the marketplace. As of the Memorial Tournament (21 events), three types of wound, three-piece balls accounted for 15 victories. Four types of high-spin two-piece balls accounted for four wins and the remaining two victories came via new entries—Bridgestone's four-piece ball and Top-Flite's Strata Tour. That's four different construction methods but nine different models. That kind of variety was unthinkable just a decade ago.

"Each ball out here has its own great characteristic," says Lee Janzen, who has played Top-Flite, Titleist and Bridgestone balls during his career. "It's

**Four-piece,  
double-cover  
construction**

The intention of the additional cover: Low spin rates off the driver and high spin rates on short-iron shots, plus added durability.

really up to the individual player as to what he's looking for in a ball. Someone who hits a low ball wants a ball with a lot of spin while somebody like Greg Norman, who hits it very high, doesn't want a ball that spins a lot. Most balls have certain little things that make each of them different from the next."

The new Bridgestone and Top-Flite balls are the latest entries in the market that attempt to perfect the feel, distance and durability equation.

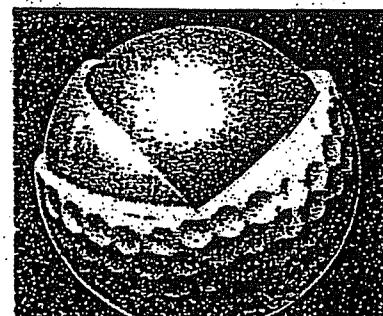
Bridgestone's new Precept Tour, which will be available this fall, is a wound, four-piece ball that Nick Faldo used to win the Masters this spring. The ball is similar to a traditional wound, three-piece ball (core, windings, cover) except that Bridgestone has added a smooth, inner cover, or mantle, under the outside cover. Call it double-cover technology.

"The wound part of the ball is not quite as big as that of a traditional three-piece balata ball," says Rojas. "It's de-

signed to feel like a balata ball but give you the distance and consistency of a two-piece." Comparing the Precept Tour with another Bridgestone high-performance ball, the two-piece Precept EV Extra Spin, Rojas says the four-piece ball is "softer and spins a little more but may be a little shorter. Its roundness holds up a little better, and it is more consistent over a longer period."

Top-Flite's three-piece Strata Tour is similar to a two-piece ball (core and cover) but differs in that it, too, includes an inner cover, or mantle. Top-Flite calls this process "multi-layering," which is similar to the way Wilson manufactures its Ultra 500 series of balls. The Strata Tour was designed specifically for low-handicap players and for high performance from 50 yards and in, according to Mike Sullivan, senior director of research for Spalding.

"The relative hardness between the layers enables you to tailor the spin characteristics of the ball," says Ralph Peterson, manager of research and development at Wilson. "You can make it a high-spinning ball or a low-spinning



The multi-layer ball  
High-spinning accuracy and the grain  
is also a feature of this design

SHERRY GROUP, INC.

COMMUNICATIONS SPECIALISTS



### Traditional three-piece, wound ball

Balata, Urethane and Surlyn covers have allowed wound balls to be played by those looking for both distance and high spin.

ball, and using technology you can modify things such as spin, durability and cut resistance."

Some background information might help. A ball hit with a driver has a higher-impact velocity (it leaves the face faster) than one hit with a wedge. There are two reasons for this: greater swing speed and less loft. As you go through your bag from driver to wedge, the compression on the ball at impact decreases with each club. The harder the hit, the deeper the compression of the ball. The deeper the compression, the more the core and inner layer come into play.

According to the manufacturers of these new balls, the inner cover reduces the compression at impact so that the ball jumps off the face faster and with less spin when hit by a driver. Conversely, when the ball is hit by a wedge, the compression is not nearly as severe and that allows the softer, outer cover to pinch against the clubface and give the ball more spin.

"Multi-cover technology is intriguing, no question about it," says Wally Uihlein, chairman and CEO of Titleist and Foot-Joy Worldwide. "We'll be looking at it to see if it brings to the market any added value where the value previously did not exist."

Golf balls continue the trend toward custom fitting for every kind of golfer imaginable. The beneficiary of all this

competition and innovation is the consumer, but only if he or she can keep the various models straight and know what ball best suits his or her game.

Titleist, for example, features six models of two- and three-piece balls in addition to five more in its two-piece Pinnacle line. Top-Flite features seven different models including the Strata Tour. Bridgestone has four balls in its EV line in addition to the Precept Tour. Maxfli has five varieties. Wilson and HPG (Hansberger) have eight. Slazenger has four and Hogan features three models in its line.

For those of you scoring at home, that's 51 different models of golf balls. And don't forget that both Callaway and Cobra will soon become players in the ball market.

"There are not too many horizons to explore in terms of aerodynamics with golf balls, but there are when it comes to the interfacing between golf ball and



### Two-piece construction

Two-piece balls have come a long way since their distance-only debut in 1968.

clubhead," says Rick Watson, director of golf-ball marketing for Top-Flite.

So what does the future hold for golf ball design? Will we see five- and six-piece balls?

"I think the future is a one-piece ball," says Rojas, "but that's a long way off."

—PETER FARRICKER



THE WALL STREET JOURNAL

COMMUNICATIONS SPEL

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FRIDAY, AUGUST 16, 1986 \$1

# MARKETPLACE

## The Ball Is Golf's Last (Cheap) Holdout

By JAMES F. STEPHEN  
Staff Reporter of THE WALL STREET JOURNAL

**C**ONSIDER THE GOLF BALL. It's the single most popular good in sporting goods, an international roll model. Flight model, too. No orb in sports soars with its ubiquity, or ambiguity. Its arc is a study between celestial grace and farcical kerplunk.

But where is this damnable beloved sphere coming from, where is it going, and where do those who control its fate want it to go? ("In the hole," is an unacceptable answer for treatises at this level!)

Last year, by one estimate, golf balls sold world-wide at a rate of about 2.3 million per day; roughly \$1.15 million in all. Two-thirds were bought in the U.S. Excluding cheap driving-range balls, the average retail price was about \$2.50. But they can be had for as little as \$1.25. This, for the golf industry, is the rub: They're too cheap!

Industry in sports has pushed hyperbole's envelope more in recent years trying to convince its players that they can buy a better game. With the number of U.S. golfers stuck at 25 million since 1981 (annual growth: 0.2%), says the National Golf Foundation, equipment makers want golfers to trade up, and often. Their motto: The more you pay, the better you'll play. It's worked, to some extent, for clubs, fees, shoes and clothes. But not for balls.

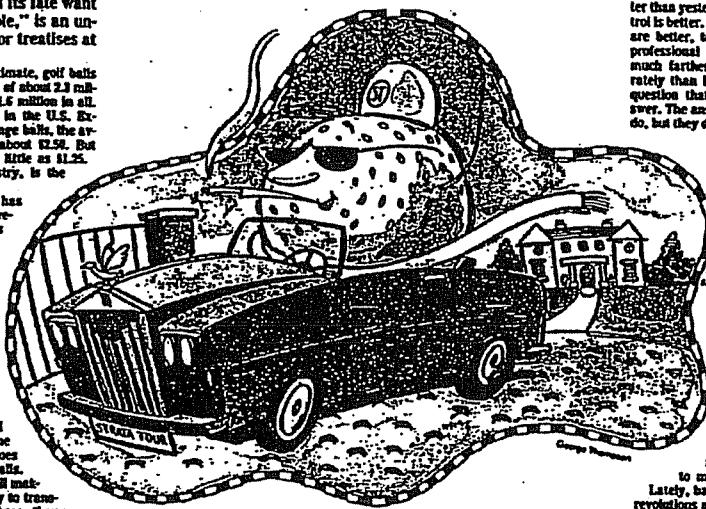
In the past decade, ball makers have labored mightily to transmogrify their humble sphere. They reconstituted its internal organs with highly scientific (and secret) plastic guts. They thickened, thinned, layered its skin. Its body went oversize and underweight. Its dimpled face got more grits than Phyllis Diller's. It was tattered up like a Happy Hooler (to be fair, I know of no happy scientists). It was made mysterious and "dangerous." It was designed by rocket scientists. It was turned from a ball into a "system."

In 1985, only 147 separate balls (made by 23 companies in eight countries) were listed as "conforming" to golf's official rules. Last year, more than 1,500 different balls (made by 84 firms in 33 countries) were on the list. (An unlabeled ball can't be used in sanctioned tournaments; pro Greg Norman disqualification himself from one in June when he discovered his Maxfli ball was stamped XS-9 instead of the listed XS-8.)

So far, the golf ball remains true to all forms of chicanery. It is a tribute to the free enterprise system—a financial flavor of vanilla. Today, a golfer can pay \$150 for greens fees, \$100 for a golf shirt, \$175 for shoes and \$1,000 for a titanium driver, and then step up to the first tee and, too often, pull out a ball that cost all of a buck and a quarter.

Oh, the shame of it!

Golf balls are cheap to buy because they're easy to make (as little as 2 cents apiece, by one estimate). Competition is fierce. Creating cheap-ball angst that can be answered with expensive balls isn't easy. Goliath dictates: Golf balls come in two basic varieties, three-piece, the kind that 95% of professional golfers



use, and two-piece, which are 8% of other golfers use.

The three-piece ball has a solid or liquid center tightly wound with rubber threads; most are covered with synthetic leather (the real stuff was made from a tropical tree sap). This ball evolved from a thread-wound, rubber-covered ball invented in Cleveland in 1931. The Scotts, who are credited with inventing the game, used hard leather balls stuffed with a "gentleman's top-hat full" of goose feathers for four centuries. In 1948, the first solid rubberized ball, called a "gutta-percha," came along. It was made from evaporated tree sap from Malaya, now Malaysia.)

The three-piece ball has a short lifespan—it cuts easily and goes out of round quickly when whacked a few holes. But it has superior "feet" and "control." Pro such as Gary Player, who is noted for his touch on the ball, can hook, slice or add backspin to these balls at will.

The two-piece ball has a solid plastic center that looks like hardened bobo-bean, and a plastic cover (usually a Suryon blend from DuPont). First sold in 1971, it is harder and more durable, capable of lasting a summer if it doesn't find a pond first. It goes farther than a three-piece but is harder to control. Jack Nicklaus once likened it to playing with a marble. Its virtue is that it is very cheap to make—about \$4 to \$5 a dozen, says ball engineer Troy L. Puckett, president of Cayman Golf Co., maker of regular balls and a so-called outlaw ball sold as the "Desperado" (\$26.95 a dozen retail), which is smaller and heavier and can go

farther than golf's rules allow.

These rules, enforced by the United States Golf Association and the Royal and Ancient Golf Club of St. Andrews, Scotland, say a ball can't weigh more than 1.62 ounces and can't be smaller than 1.68 inches in diameter. Standards adopted in 1921, it can't have an initial velocity off the club face of more than 250 feet per second and can't travel more than 200 yards, on average, when hit with a lesions machine that mimics the classic swing of former great Byron Nelson. Size, weight, a blimp quality; weight wise, a Ping-Pong ball. Otherwise, differences are subtle.

There's simple diversity: Balls on today's conforming list have from 218 to 652 dimples, with different sizes and depths; but balls have been made with as few as 252 and as many as 612. Dimples aid aerodynamics, putting air over the top and creating pressure underneath, like an airplane wing, and, depending on configuration, causing the ball to fly higher, straighter, farther—or the opposite. Degrees of hardness, or compression, make the ball go farther and more difficult to control—or vice versa. Putting most of a ball's weight near its center makes it spin more, which increases control; with perimeter weighting, distance is gained.

The perfect ball would offer maximum distance and maximum control. But so far, golfers can't have both. They choose between a hard-cover two-piece for distance or a soft-cover three-piece for control, or some new cross-bred mutant that supposedly promises both. It takes a very good golfer to tell the difference between the three- and two-piece, says Frank

Thomas, the USGA's technical director. The average hacker can't, although what golfer would admit to being average? What happens when they shop for balls, says Mr. Thomas, is they fall for the hype, opting for balls used by their favorite pros—balls these pros not only get free but also are paid sometimes a half million dollars by ball makers to use.

Mr. Thomas watches all this with detached amusement. Today's balls are better than yesterday's, he says. Quality control is better. Fewer balls per dozen. Clubs are better, too. So, is that why today's professional superstars hit the ball so much farther and so much more accurately than in the past? This is a trick question that Mr. Thomas loves to answer. The answer: Everybody thinks they do, but they don't.

In 1961, the length of the average drive on the pro tour was 258 yards, he says. In 1985, it was 263 yards. That's an improvement of only five yards in 24 years. The 1.3% difference is the result of the fact that both golfers and fairways are in better shape these days, he says. As for better accuracy, Mr. Thomas notes that the winning score in pro tournaments is improving at a rate of only about one stroke every 25 years.

That hasn't stopped ball makers from touting each new ball-touting as truly "revolutionary"—the ball that's going to make other balls "obsolete."

Lately, ball makers are stressing that revolutions aren't cheap. Two years ago, American Brads' Acushnet Co. introduced the three-piece "Fleld Professional" at \$50 a dozen (\$1.17 each—the most expensive ball in golf). In April, Spalding Sports Worldwide debuted the two-piece "Top-Fleld Strata" at \$32 a dozen (\$4.33 each)—the next most expensive ball in golf.

Spalding humbly calls its Top-Fleld Strata debut "the most exciting product launch in recent history." A \$6 million ad campaign was part of the excitement. The idea, says Scott Crevilman, Spalding's senior vice president in charge of golf products, was to "find a product the best players would switch to"; that is, a durable two-piece ball with two "covers": an inner one that's hard and makes the ball go far and an outer one that's soft and, thus, offers good spin control.

He says he can hardly believe the word-of-mouth the Strata is generating (even though it seems like most of the words are coming from his mouth). To wit: It's so hot its entire production is sold out through September; dozens of touring pros are begging for samples; golfers are breaking into other golfers' lockers and stealing them, and offering \$200 a dozen, under the table, for them. (Actually, Pro Golf Discount in Bangor, Maine, among other retailers, has already stacked its price to \$40 a dozen.)

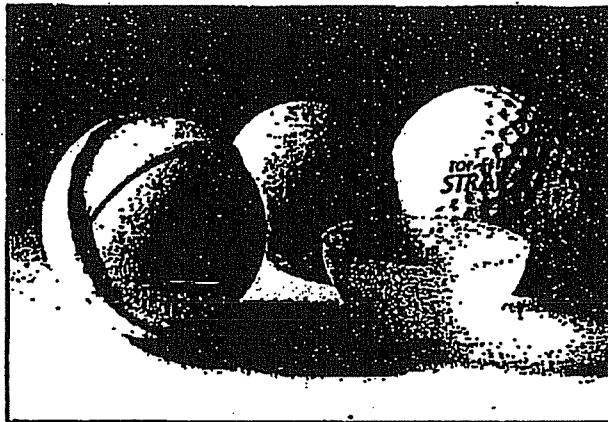
"We see this as an opportunity to obsolete the thread-wound ball," says Mr. Crevilman. His boss, George Dickerman, said of another Spalding offering called the "Tour Edition," a plastic-covered, two-piece ball: "In three or four years, we'll make balls-covered balls obsolete." That was 10 years ago. Fare!

## SPORTS



# Los Angeles Times

Monday, September 30, 1996



Spalding Sports' Top-Flite Strata combines soft- and hard-ball advantages.

HOT STUFF/MARY PURPURA and PAOLO PONTONIERE

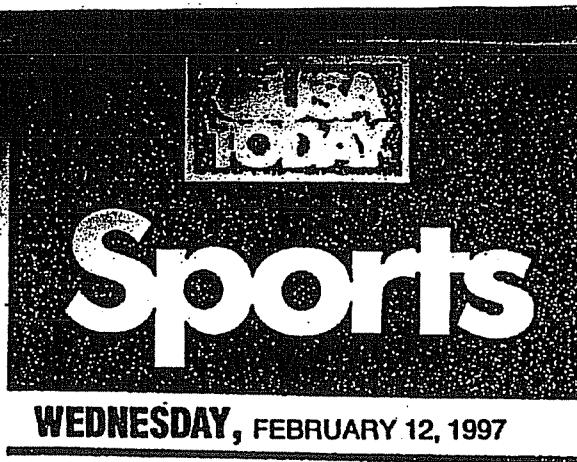
## New Golf Ball Blends Distance and Control

**T**raditionally, golfers have had to choose between soft balls that offer greater control and hard balls that go farther. Now Spalding Sports Worldwide of Chicopee, Mass., ((800) 225-6601) has developed a ball that combines the benefits of both.

"Never before have we seen such enthusiasm from tour players for a new product during testing," says Mike Sullivan, Spalding's vice president for research and development. The hybrid Top-Flite Strata got a big push when Professional Golfer's Assn. pro Mark O'Meara won two firsts and two seconds in a few weeks using the ball.

What makes the Strata so special? Spalding modified its two-piece tour ball into a three-layer design by adding a hard layer (for distance) around the soft inner core and under a rubbery outer cover (for control). The Top-Flite Strata is available in stores that sell golf equipment and retails for about \$52 per dozen.





## Innovative three-piece ball suits

### 'guinea pig' O'Meara's game better

Potter  
SA TODAY

Mark O'Meara has become good salesman for Top-Flite, even though the only thing noteworthy about him is the scores he's shooting on the PGA Tour. Eight months ago he was the only Tour player using the Stra-Tour ball. Now there are about 35. Total sales of the ball are nearing \$20 million. "He's not a flashy guy, but other players view him as a leader," said Joe Henley, director of marketing and development for Top-Flite.

#### Golf

"You can mention Tiger Woods, Tom Lehman and Mark in the same breath when you're talking about the best players in the game."

O'Meara said he was "a guinea pig" when Top-Flite came to him last spring with the idea of playing their new three-piece golf ball that was supposed to combine the best properties of a solid ball and a wound ball.

In the last 13 months O'Meara has earned \$1.9 million on Tour.

He has won back-to-back events — the Pebble Beach (Calif.) National Pro-Am and Buick Invitational — and leads the PGA Tour in earnings with \$710,460 in four events.

O'Meara's success since switching puts him in an unusual position.

He leads the USA in the standings of the Ryder Cup and Presidents Cup.

The USA plays Europe in the Ryder Cup Sept. 26-28 at Valderrama in Sotogrande, Spain.

The Presidents Cup, which pairs the USA against an international team from non-Ryder

Cup countries, will be played at Australia's Royal Melbourne Golf Club in 1998.

O'Meara is taking two weeks off before returning to the Tour at the Nissan Open Feb. 27 in Los Angeles.

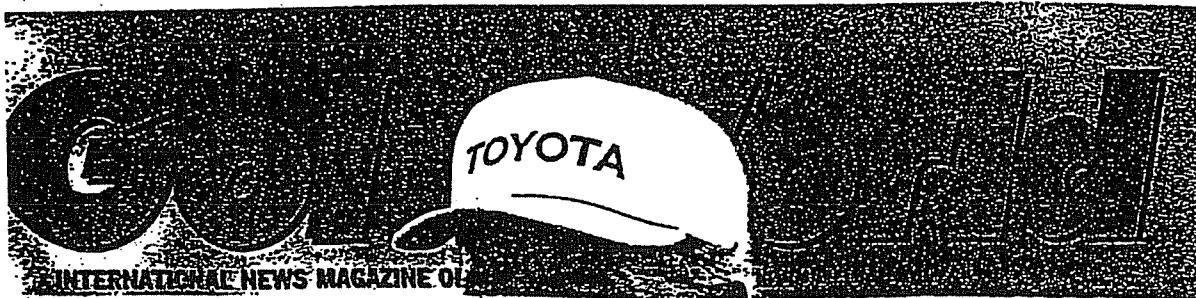
O'Meara has had great success with cars. He has won a Buick, Oldsmobile, Chrysler, Mercedes, Isuzu and a Honda, prizes given out by tournament sponsors. The one he hasn't won: a Toyota, the company O'Meara represents.

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#### **Bunker & Bunker**

## **O'Meara's new gear**

**M**ark O'Meara's victory in the Greater Greensboro Chrysler Classic was good news for the people at Taylor Made and Top-Flite responsible for new equipment development. O'Meara used Taylor Made's new Burner irons and a soon-to-be-released Top-Flite multi-layered construction ball.

"Two weeks ago at the Masters, I went with the new [Burner] irons that don't have the bubble shaft yet," he said.

O'Meara won at Greensboro using new clubs and a new type of ball.

"It's a new design that I've been involved with. This week I had the 2-iron through sand wedge. They're similar to what's on the market but with less offset, and more of a tour model, but very new."

About his ball, O'Meara said, "It's a new golf ball that Top-Flite has produced. It really doesn't have a name yet. It was approved by the USGA [March 25] when the last approval list came out. And basically, it's a multi-layer construction golf ball."

"That's what Top-Flite wants me to try. I've tested it, and it's going to be introduced at the U.S. Open."

PHOTO: AP/WIDEWORLD



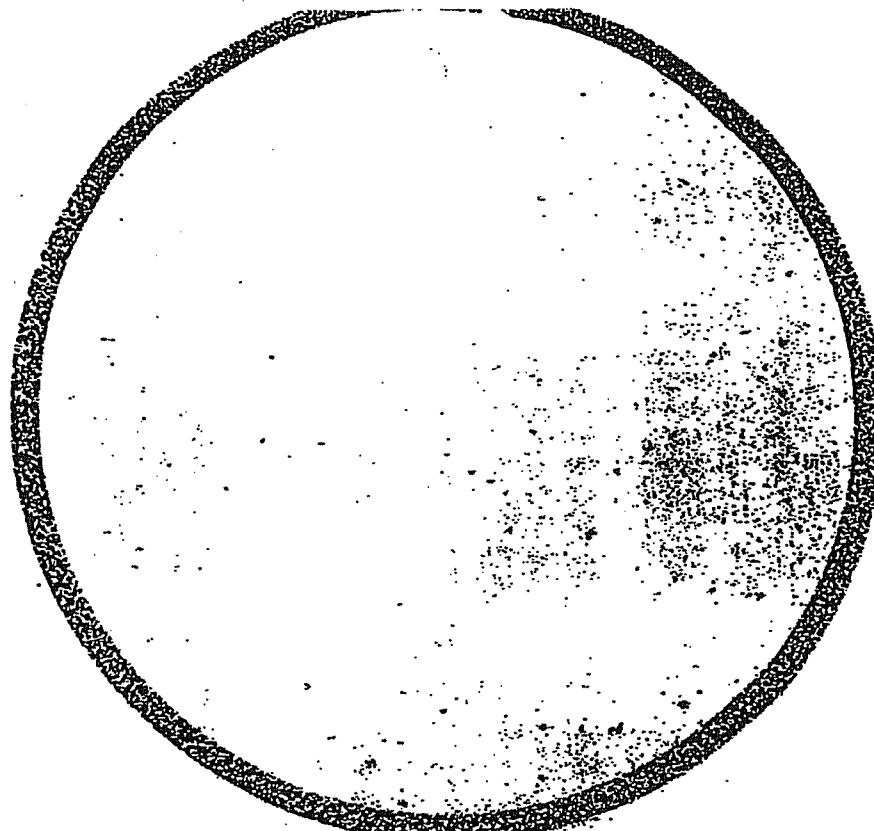
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**Titleist HP2  
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A new double-  
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from the king  
of wound golf  
ball technology.

**By Mike Chwasky**

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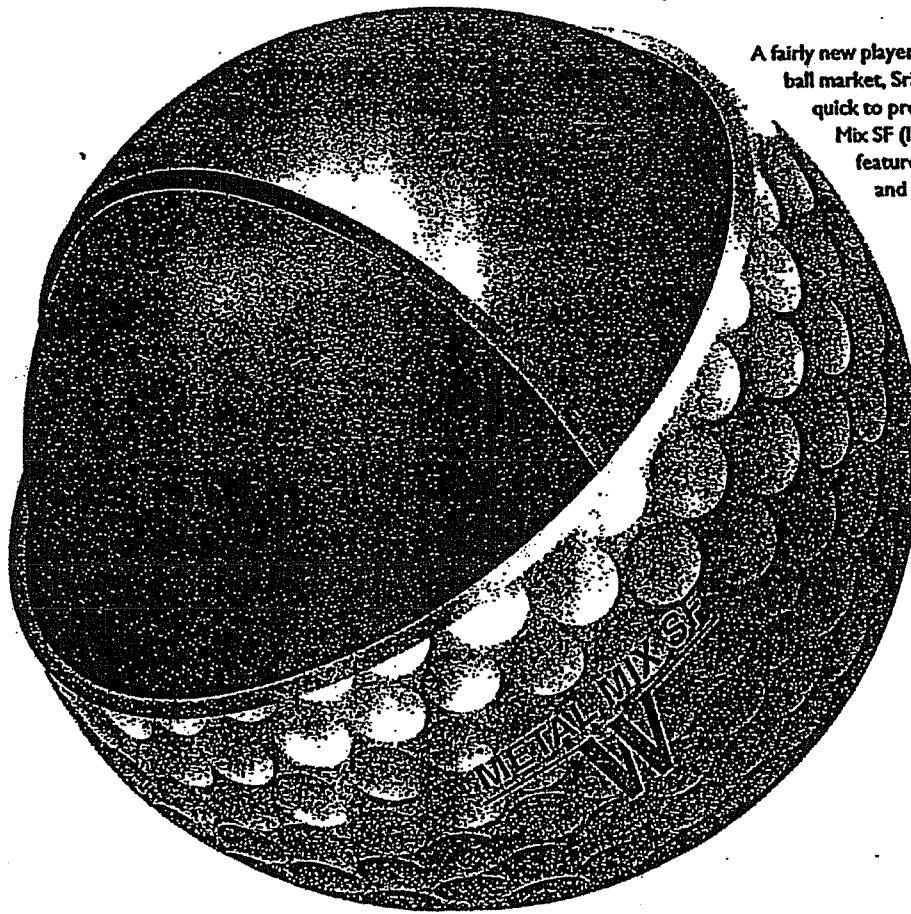
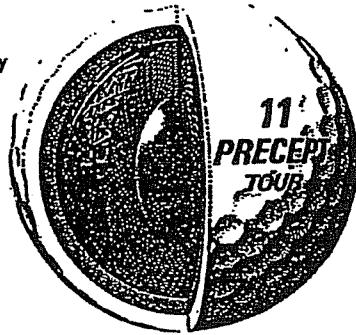
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**Selecting a golf ball** isn't easy anymore. It seems like just a few years ago things were still fairly cut-and-dry: Pros and good players used the soft, high-spin balata variety, and everyone else used hard, surlyn models that were lost long before they wore out. It was a simple time, when optic yellow and orange were still okay, and even the occasional X-OUT wasn't a terrible thing. Things have changed though, as research and development departments around the industry have continued to develop and apply new technologies to the manufacture of today's golf balls.

The two most significant new technological developments, both of which have become quite prevalent lately, are the multi-layer (aka double cover) design and the metal core or metal cover design. For those who aren't familiar with the different methods of golfball construction, these design fea-

tures probably sound like fairly radical departures. However, it's important to understand that they're mostly variations or improvements on traditional two- and three-piece golf ball designs. (Note: Generally, a two-piece golf ball consists of a solid core and cover, while a three-piece golf ball consists of a solid or liquid-filled core, a high-tension wound layer and a cover.)

Bridgestone utilizes double-cover technology in the Precept Tour Double Cover (right) to help protect the integrity of the ball's windings and preserve its roundness.



The first ball that really caught multi-layer construction to the fore was the Top-Flite Strata. Prior to the Strata's release, Top-Flite was well known as the largest manufacturer of two-piece golf balls in the world. The problem for Top-Flite, however, and other companies that had committed to two-piece technology, was that while it was fairly easy to make golf balls with good distance and durability characteristics, it was difficult to make ones that could provide the spin and feel associated with three-piece, wound models. That's not to say that there weren't some very good two-piece balls on the market, because there were, some of which were played with success on the PGA Tour. But most would agree that all in all, the wound ball still provided the best spin and feel. Accordingly, pros and good amateurs swore by them.

Then came the Strata. Featuring what Top-Flite calls "breakthrough multi-layer technology," the Strata consists of a solid core, a firm inner layer and a soft outer cover. What this construction provides, according to Top-Flite representatives, is a non-wound product that can produce the spin and feel of a wound ball, while maintaining good distance characteristics. The key elements, though, are the spin and feel because that's what solid-core, non-wound balls traditionally lacked.

A testament to the Strata's performance characteristics is the unprecedented Tour acceptance it has achieved for a non-wound golf ball. A notable example of a Tour player using the Strata is Mark O'Meara, who played it in his win at the Masters earlier this year.

In regard to the future of golf ball technology, Top-Flite vice president of research and engineering Mike Sullivan comments, "Wound golf balls won't go away for a number of reasons, but over the next five years or so you'll see a proliferation of

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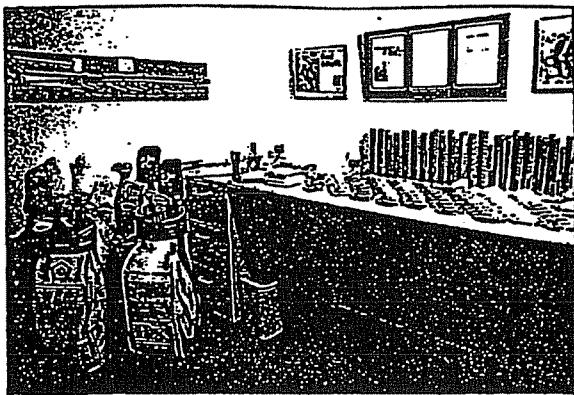
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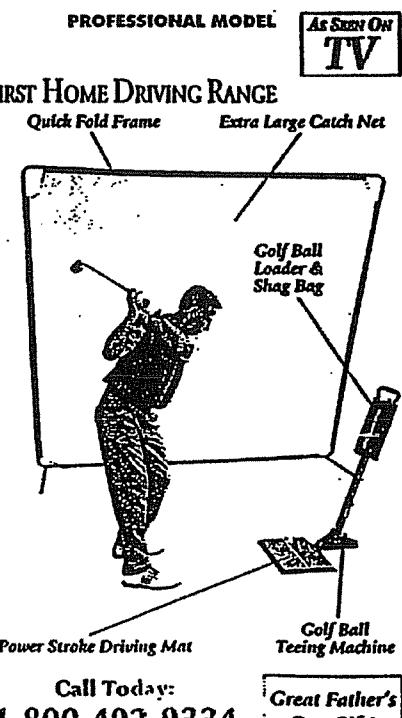
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## “T”LL METAL JACKET

multi-layering from a variety of golf ball manufacturers." Further evidence of this fact is Top-Flite's new Ball/Club System golf balls, which also feature multi-layer technology.

When it comes to golf ball manufacturing, no company is more well known or more closely associated with wound technology than Titleist. That's why it's so significant that the company's new HP2 Distance features double-cover technology.

But according to George Sine, vice president of research and development at Titleist, the company has employed this technology for a different reason than others have. "Our competitors have tried to replicate wound-ball performance with double-cover technology, but we have no reason to do that, for obvious reasons. We found that the best use for a double cover is to lower the spin rate of a golf ball, which in turn creates more distance. And, with a firm outer cover and a soft inner cover, we can also produce a ball that has feel."

Regarding the future of golf ball manufacturing and double-cover technology, Sine adds, "At Titleist, we're constantly seeking ways to provide discernable performance benefits to golfers. If we feel there's a technology that can help our products do that, then we'll pursue it, but we'll never introduce a new technology for marketing purposes only." Sine also comments that double-cover technology will continue to be particularly useful in the production of distance-oriented golf balls.

Bridgestone, manufacturer of Precept golf equipment, is a company that's using double-cover technology in both wound and non-wound products. According to Kelly Ellis, marketing manager at Precept Golf, the reason for this is because double-cover technology allows manufacturers to do different things with performance characteristics, depending on the product.

74 Golf Tips

"With the Precept Dynawing, firm cover and soft inner layer over an ultra-soft core provide an excellent combination of distance and feel. That's why this technology is so useful—it allows you to combine conflicting characteristics."

The Precept Tour Double Cover also features double-cover technology, but this time in conjunction with a solid core and a wound layer. About this construction, Ellis says, "Over extended use, wound balls go out of round. That has been proven. But, in the case of the Tour Double Cover, the multiple layers protect the integrity of the windings and help the ball retain its roundness. And, because of the reinforced covers, the Tour Double Cover is longer than typical high-spin, wound golf balls."

A multi-layer product that has been taking the professional Tours by storm lately is the Maxfli Revolution, which the company refers to as a "premium new construction" golf ball. The main difference in the construction of the Revolution versus other multi-layer balls is the Revolution's elastic inner layer, which Maxfli vice president of research and development John Calabria says is superior to a solid inner layer because of the enhanced feel it provides. Calabria also says the Revolution's large core and extremely resilient urethane cover

## Golf Ball Websites

[www.kascogolf.com](http://www.kascogolf.com)

[www.maxfli.com](http://www.maxfli.com)

[www.preceptgolf.com](http://www.preceptgolf.com)

[www.ramtour.com](http://www.ramtour.com)

[www.siazengergolf.com](http://www.siazengergolf.com)

[www.srixon.com](http://www.srixon.com)

[www.sumnerandgolf.com](http://www.sumnerandgolf.com)

[www.titelist.com](http://www.titelist.com)

[www.tophole.com](http://www.tophole.com)

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can provide distance advantages for players with both high and moderate swing speeds.

On multi-layer technology, Maxfli director of global golf ball marketing David Longfritz comments, "The premium new construction golfball represents what we feel is a long-term, growing segment in the market. Accordingly, you can expect to see this technology around for quite some time."

Kasco, a long-time manufacturer of multi-layer products, has taken solid-core, multi-layer technology to an extreme with the company's four-piece Rockets golf ball. According to company representatives, the Rockets consists of a hard center core for driving distance, a soft second core to absorb impact on shorter shots, a hard third core for distance on full iron shots and a durable ionomer cover, all of which are supposed to combine to produce a "unique distance ball for all golfers." Says Kasco president Mike Nokano, "Rockets are golf's answer to afterburners. We call them Rockets because of the way they literally rocket off the clubface."

Thanks largely to Wilson Golf and the company's Staff Titanium line (which features titanium in the core), multi-layer technology is joined by metal technology as the newest trend in golfball design. According to Frank Simonutti, senior polymer chemist at Wilson, the core of the golf ball is the place where titanium is the most useful because it bonds the core materials, producing a golf ball that maintains high velocity without feeling hard.

In the company's new Staff Titanium Double Ti, however, which features a double cover, there's titanium in both the core and inner cover of the ball. Simonutti explains, "The Double Ti provides excellent distance because of the titanium core, and we tailored the titanium inner cover and surlyn outer cover to the core to balance the spin rate

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76 GOLF TIPS

with the distance. By doing this, we think we have a ball that's getting closer to the ideal of optimum distance and optimum spin."

Another company that's using both multi-layer and metal technology in its products is Srixon, a fairly new player in the U.S. golf ball market. Aptly named, the company's Metal Mix SF model features a solid core, a perimeter-weighted tungsten mid-layer and a high-elastic ionomer cover. What this construction provides, according to company representative Sean Hanafusa, is a product with a high moment of inertia that won't necessarily spin at a higher rate, but will maintain its spin for a longer period of time.

Ram Tour (aka Hansberger Precision Golf) also utilizes both multi-layer and metal technology to produce products that company president Terry Pocklington says offer "both feel and response while maintaining velocity and distance." An example of this is the Ram Tour Bala-  
ta DC, which is comprised of a titanium outer cover, a proprietary thermoplastic inner cover and a neodymium core.

"Neodymium creates the most resilient rubber, which produces the highest velocity and greatest distance," says Pocklington, who adds, "If you don't have initial velocity, you can't get distance. That's why metal chemistry is so valuable."

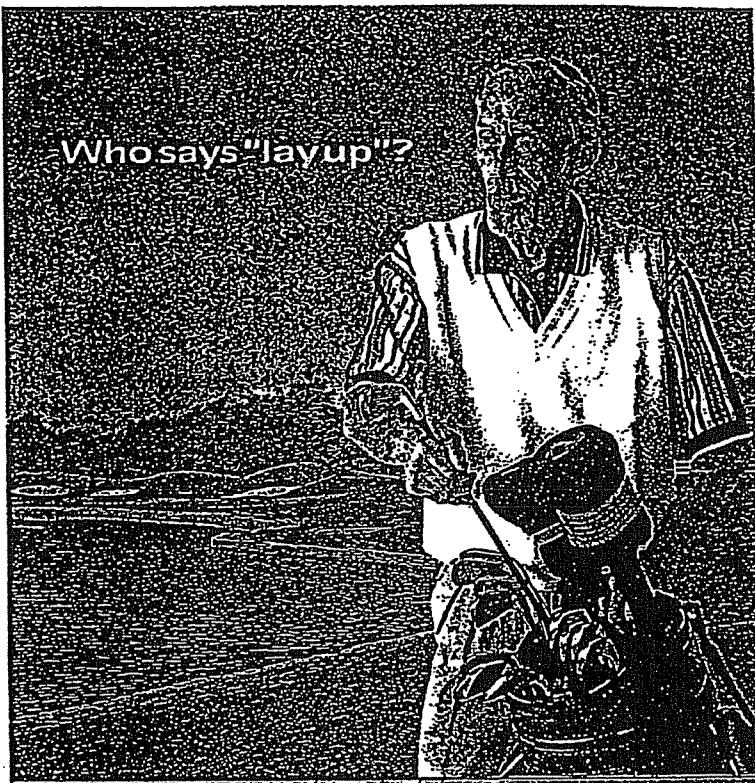
After considering all of these layers, metals and constructions, the average recreational golfer is probably left asking, "Is any of this really going to help me and, if so, how do I choose the right golf ball for me?" The answer to the first part of the question is simply, yes. Thanks to the many technological advances made by manufacturers, the quality and consistency of today's golf balls is at an all-time high.

The answer to the second part of the question is a little more complicated, but not terribly so. Basically, your goal in choosing a golf

ball should be to match its performance characteristics to the needs of your game. To accomplish this, do some research and find out which models offer the right mix of distance, durability, spin, feel and price. If you have access to the Internet, try exploring some of the manu-

facturers' Web sites—most have them and almost all offer some kind of custom ballfitting questionnaire. You can also resort to the oldest and most basic form of research—experimentation. Try a variety of different models until you find one that works best for you. **GR**

### Who says "layup"?



### Rapport says "go"!

Age translates to wisdom in any sport. And if you're playing Rapport shafts in your clubs, the wise thing to do is knock it over the hazard like you used to.

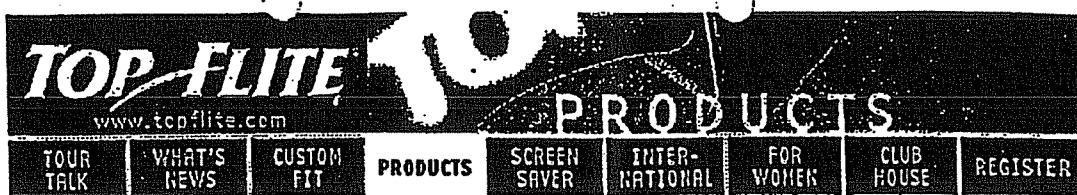
In addition to providing shafts for club manufacturers like Adams® Tight Lies™, Rapport has a growing number of authorized clubmakers who will fit you with the right shaft for your game.

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Ask your golf professional, or contact us at 800-783-0156 for the authorized Rapport clubmaker nearest you.

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## TOP FLITE<sup>®</sup> STRATA<sup>™</sup>

### The #1 Multi-Layer Ball On Tour.

#### Top-Flite's Breakthrough Multi-Layer Technology Is The Most Remarkable Yet.

Since the turn of the century, Spalding has led the way in technology, from the first dimpled golf ball in 1909 to today's line-up of high performance balls for every level of play. In fact, over the past 5 years, no other U.S. manufacturer has obtained more patents covering materials and construction than Top-Flite.

And now, with the multi-layer technology of the Top-Flite® Strata™ Advance, the performance bar has been raised higher than ever before.



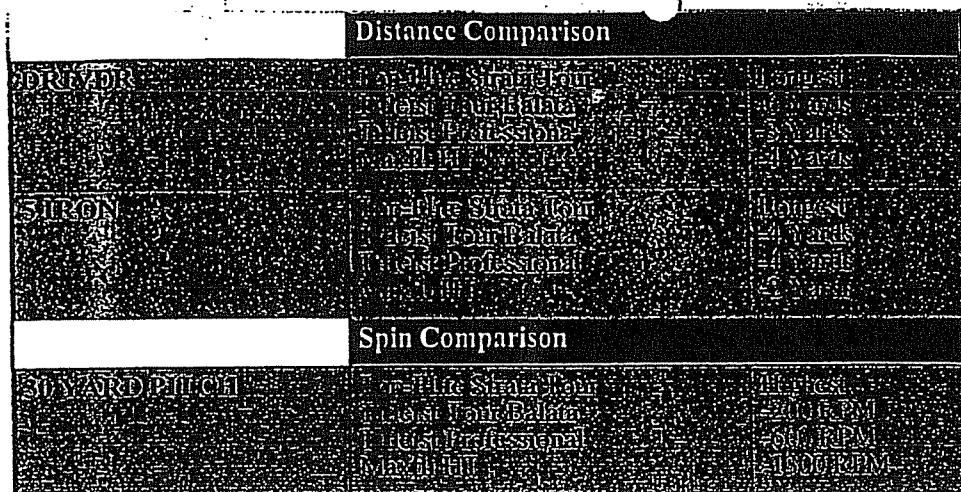
#### Top-Flite Strata Tour's Impressive First Year on the PGA Tour.

Dozens of professionals worldwide have already switched to the new Top-Flite Strata Tour, including former wound ball players Mark O'Meara and Jay Don Blake. And the results have been impressive. Since switching to Strata Tour, O'Meara has reached the top 5 on the PGA Tour in money, in scoring, in greens in regulation and in birdies. Strata Tour has also recorded numerous Tour victories in its first year such as: O'Meara's win at Greensboro, D.A. Weibring's GHO victory, Walt Morgan's first place honors at the SPGA Ameritech, not to mention several international wins.



#### Top-Flite Strata Tour. Patented Multi-Layer Construction Sets a New Standard in Golf Ball Performance.

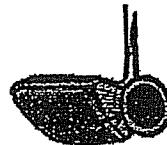
The multi-layer design of Top-Flite Strata Tour has redefined golf ball technology. By combining a super soft ZS Balata™ cover with a firm inner layer and a high-energy soft core, the new Strata Tour offers excellent distance off woods and longer irons with unequalled feel and control on short iron shots and around the green.



**Computer-Aided Design and  
Breakthrough Materials Make  
State-Of-The-Art Performance  
Possible.**

The Strata Tour construction is revolutionary both inside and out. Its core composition is a patented polymer that delivers a remarkable combination of softness (for feel) and maximum distance. The patented inner layer, which is the impressive power behind Strata Tour, contains an exclusive formulated ionomer material.

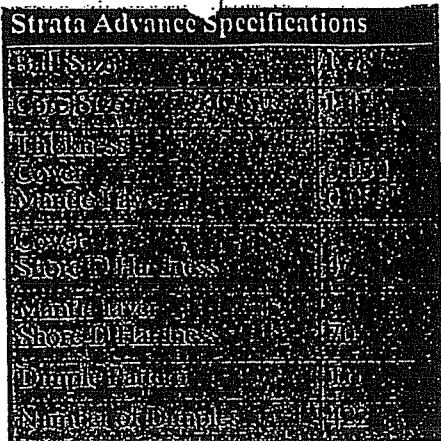
Top-Flite Strata Tour has a new ZS Balata™ outer cover that is also patented. Its advanced polymer construction makes it not only soft and resilient, but cut resistant. This translates into added confidence on those all-important scoring shots around the green. Just as important, Top-Flite Strata Tour also provides consistent, reliable performance shot after shot, and hole after hole.



With woods and long iron shots, the firm inner layer and high energy core combine to produce low spin and long distance.



With short iron shots and around the green, the ZS Balata™ cover produces unequalled spin control with balata ball feel.



**Strata Advance Specifications**

• Top-Flite  
• Top-Flite Cover  
• Montebello  
• Cover  
• Soft Feel  
• Multi Layer  
• Soft Feel  
• Double Pattern  
• Number of Layers

**You'll See The Top-Flite  
Strata Tour On The  
Professional Tours... And At  
Golf Professional Shops.**

The performance of Top-Flite Strata Tour continues to attract the attention of top tour players worldwide. Players like Jim Furyk and 1996 GGO winner Mark O'Meara have seen the difference Strata Tour can make in their game, and have made Strata their ball of choice for 1997.

The Top-Flite Strata Tour comes with a 100% money-back guarantee if you are not completely satisfied.

For more information on Top-Flite Strata Tour, call 1-800-225-6601.  
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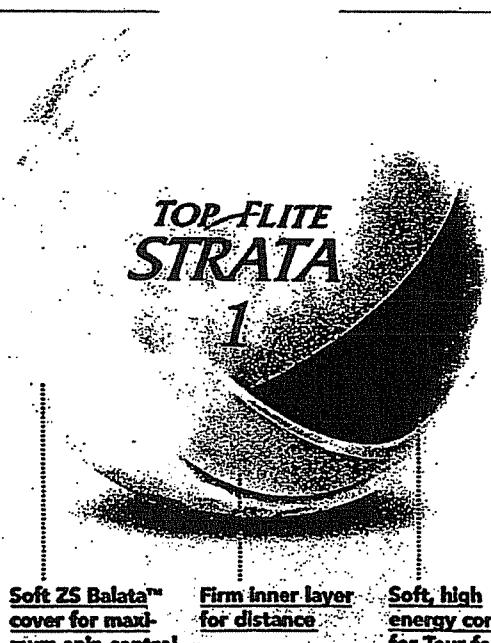


**You want to know more about Strata's Product Benefits and Features?**

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Top-Flite 1997



# MEET THE NEW MASTERS CHAMPIONS: MARK O'MEARA AND TOP-FLITE STRATA.



CONGRATULATIONS MARK O'MEARA,  
THE 62ND MASTERS CHAMPION

Top-Flite and Etonic congratulate Mark O'Meara for winning his first green jacket and his first major tournament as a professional.



**SPALDING**

**TOP FLITE**

**Etonic**

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CW 0300514

20

**CW 0300515**

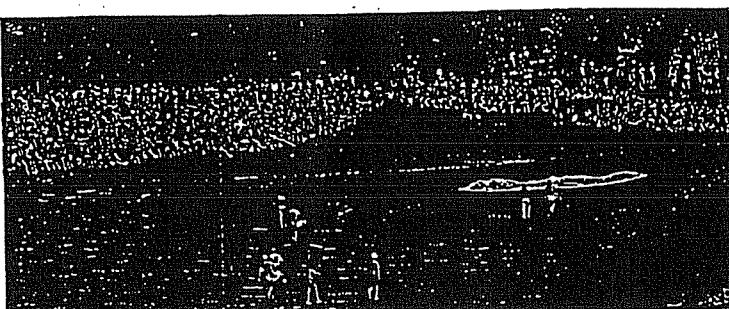
# STRATA: THE #1 MULTI-LAYER BALL ON TOUR.



soft, cut-proof Z-Belata cover for maximum spin control

In April 1996, Mark O'Meara switched from a wound ball and became the first PGA Tour Professional to play our new multi-layer Strata. Later that month, he used it to win the Greater Greensboro Open. In May, D.A. Weibring also switched to the Strata and, he promptly won the Greater Hertford Open. Like anything else on Tour that performs this well, the ball caught on. Today, over 150 touring professionals representing every Tour worldwide make the Top-Flite Strata their ball of choice.

The Strata's breakthrough multi-layer



construction continues to redefine performance for top pros. Its firm inner layer produces long distance off the tee, while its super soft Z-Belata™ cover and patented high energy core combine to produce unequalled spin and control around the green. What you get is a ball that performs from tee to green. One that helped Jim Furyk post 11 top-ten finishes during the 1997 season.

Of course, we've adapted the multi-layer technology to perform well for the low handicap player as well. The Strata Advance uses the same multi-layer Strata Tour construction. But it features a Hyper-Elastic inner layer for additional distance off woods and long irons while the soft, cut-proof Z-Belata cover and high energy core deliver consistent feel and spin on short irons around the green.

So, whether it's the Strata Tour for unmatched control or the

## TOUR RANKINGS

Tour Player	Before	After	Stroke
Mark O'Meara	23	6	
Jim Furyk	41	30	
Paul Stankowski	55	34	
Bill Gleason	52	37	
David O'�an	103	97	

Strata Advance for additional distance, why not buy a sleeve from your pro shop and test them against your regular ball? After all, the Strata's breakthrough multi-layer technology has worked for the top pros. We're confident it will help to improve your game as well.

In only eighteen months, 150 tour professionals worldwide have switched to the Strata Tour with outstanding results. 30 first place finishes and hundreds more in the top ten.



Bill Gleason  
1997 LAS VEGAS  
INVITATIONAL



Mark O'Meara  
1997 AT&T PEBBLE  
BEACH PRO-AM



Paul Stankowski  
1997 UNITED AIRLINES  
CALIFORNIA OPEN



**TOP FLITE**

DEDICATED TO IMPROVING YOUR GAME



MEET THE NEW  
MASTERS CHAMPIONS  
MARK O'MEARA  
AND TOP-FLITE STRATA



TOP-FLITE STRATA. The new ball from Spalding. It's a two-piece ball with a soft, energy core and a soft cover for maximum distance with minimum spin control.



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TOP-FLITE



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CW 0300518



# PLAY THE BALL THAT WON THE MASTERS AND THE BRITISH OPEN: TOP-FLITE.



MARK O'MEARA 1995 MASTERS CHAMPION  
1998 BRITISH OPEN CHAMPION

## 1998 MAJOR WINS

<b>TOP-FLITE</b>	<b>2</b>
Bridgestone	1
Maxfli	0
Titleist	0

Congratulations to Mark O'Meara  
on winning his second Major tour-  
nament of the year, adding the  
British Open's Claret Jug to his  
Master's Green Jacket. Mark plays  
the Top-Flite Strata, the new #1 ball  
in golf's Major Championships.



TECHNOLOGY TO IMPROVE YOUR GAME. **TOP-FLITE**

A TRADITION IN GOLF FOR OVER 100 YEARS. **SPALDING**

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# PLAY THE BALL THAT WON THE MASTERS AND THE BRITISH OPEN: TOP-FLITE.



MARK O'MEARA 1995 MASTERS CHAMPION  
1995 BRITISH OPEN CHAMPION

## 1998 MAJOR WINS

TOP-FLITE	2
Bridgestone	1
Maxfli	0
Titleist	0

Congratulations to Mark O'Meara on winning his second Major tournament of the year, adding the British Open's Claret Jug to his Master's Green Jacket. Mark plays the Top-Flite Strata, the new #1 ball in golf's Major Championships.



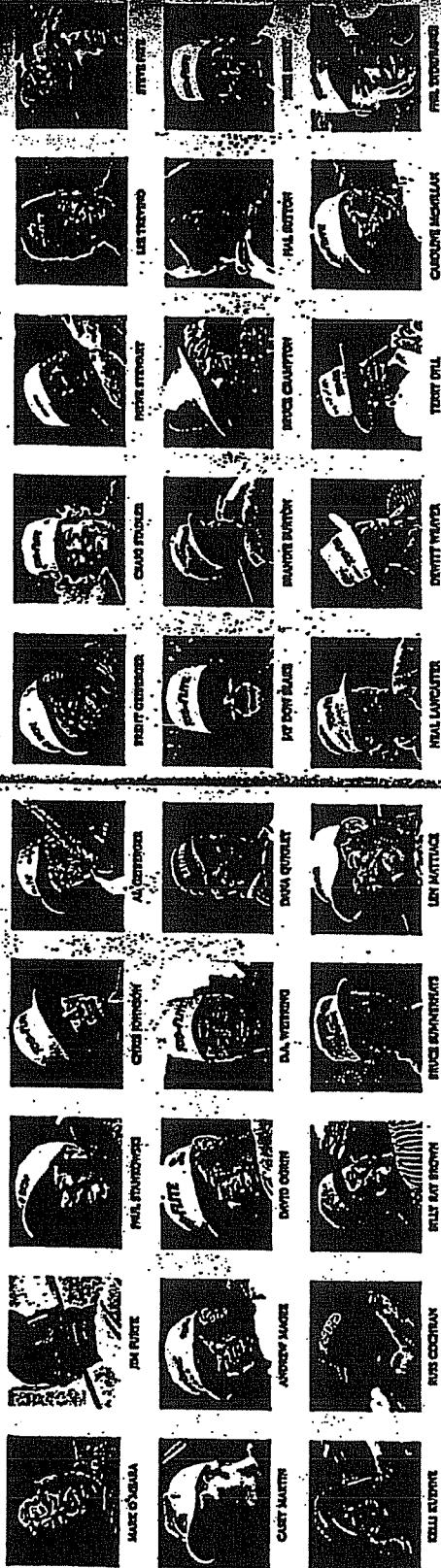
TECHNOLOGY TO IMPROVE YOUR GAME  
A TRADITION IN GOLF FOR OVER 100 YEARS. **TOP-FLITE**  
**SPALDING**

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CW 0300522



IN EIGHTEEN MONTHS OVER 250 TOUR  
PLAYERS HAVE SWITCHED TO THE TOP-FLITE  
STRATA CARE TO JOIN THEM?



Since 1996, over 250 Tour professionals worldwide have switched to the Strata Team. With outstanding results, 28 first place finishes and hundreds more in the Top Ten. Small wonder it's caught on. The Strata breakthrough multi-layer construction utilizes a thin inner layer that stays firm on the fast pitch in a soft, pliable, 23 Strata® core and premium high density core technology for increased spin and control. Around the core, 21 layers of thick, pliable, 100% polyester fibers create a

smooth, consistent feel and a soft, supple feel. Playing a round of golf has never been this easy. Call 1-800-444-4444 or visit our website at [www.strata.com](http://www.strata.com).



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HOWEVER, IT SEEMS TO  
BE CATCHING ON.



P-3724-2-F1

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/870, 585	06/06/97	SULLIVAN	M SLD-2-035-3-

DIANE F. COVELLO, ESQ.  
 DIVISION PATENT AND TRADEMARK COUNSEL  
 SPALDING SPORTS WORLDWIDE  
 425 MEADOW STREET P.O. BOX 901  
 CHICOPEE MA 01021-0901

QM12/0628

 EXAMINER

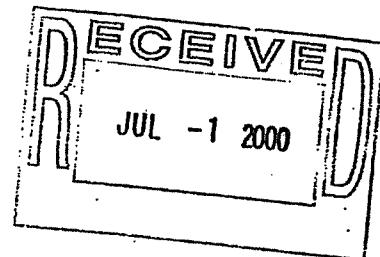
GRAHAM, M

ART UNIT	PAPER NUMBER
3711	27

DATE MAILED: 06/28/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks



CC: TK

<b>Office Action Summary</b>	Application No. <b>08/870,585</b>	Applicant(s) <b>Sullivan</b>
	Examiner <b>Mark S. Graham</b>	Group Art Unit <b>3711</b>

Responsive to communication(s) filed on Apr 10, 2000

This action is FINAL. *SEE Pg 4*

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

#### Disposition of Claims

Claim(s) 1-6 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

Claim(s) 1-6 is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claims \_\_\_\_\_ are subject to restriction or election requirement.

#### Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All  Some\*  None of the CERTIFIED copies of the priority documents have been received.

received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

#### Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Serial Number: 08/870,585

Page 2

Art Unit: 3711

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 1-6 are rejected under 35 U.S.C. § 103 as being unpatentable over Nesbitt in view of Nakamura for the reasons set forth in the previous action.

In response to applicants remark entitled A.1. the examiner responds as follows:

The applicant is claiming a low acid material. Applicant states that Nesbitt discloses a low acid material. Applicant's argument merely bolsters that of the examiner.

In response to applicants remark entitled A.2. the examiner responds as follows:

Nakamura discloses the claimed material having an acid content of less than 16%. It is irrelevant whether Nakamura distinguishes between "low" and "high" acid as defined by applicant. Applicant has claimed that the acid content be "no more than 16%". Nakamura's material meets this limitation. If applicant's material is "low acid" when it is 16% or less than Nakamura's material is "low acid" when it is 16% or less. Again it would appear that applicant's remarks merely bolster the examiner's argument.

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Page 3

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In response to applicants remark entitled A.3. the examiner responds as follows:

Even assuming arguendo that Nakamura does not disclose a "high acid" ionomer the point is irrelevant as the applicant is claiming a "low acid" ionomer.

In response to applicants remark entitled A.4. the examiner responds as follows:

Again applicant is claiming a low acid ionomer and not a high acid ionomer. However, "commercial availability" is not a condition of patentability.

In response to applicants remark entitled A.5. the examiner responds as follows:

Note Nesbitt at Col. 3, lines 16-25. Regarding the modulus, Nesbitt teaches that the inner layer modulus should be relatively high while that of the outer layer should be relatively low. The ranges claimed by the applicant are within those commonly known for golf ball cover materials and absent a showing of criticality are not considered unobvious.

In response to applicants remark entitled A.6. the examiner responds as follows:

No nexus has been shown between the alleged commercial success and the particularly claimed features of the ball of claims 1-8.

Claims 1-6 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-8 of copending Application No. 08/920,070. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application

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Art Unit: 3711

since the referenced copending application and the instant application are claiming common subject matter, as follows: a golf ball with a hard inner and soft outer layer.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending applications. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

The information disclosure statement filed 3/27/00 fails to comply with 37 CFR 1.97(c) because it lacks a statement as specified in 37 CFR 1.97(e). The information disclosure statement filed 3/27/00 fails to comply with 37 CFR 1.97(c) because it lacks the fee set forth in 37 CFR 1.17(p). The information disclosure statement filed 3/27/00 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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Page 5

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Mark S. Graham at telephone number (703) 308-1355.

MSG  
June 27, 2000

Mark S. Graham  
Primary Examiner

"Express Mail" Mailing Label No. EL581518940US  
 Date of Deposit: October 18, 2000  
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 Postal Service "Express Mail Post Office to  
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 to: Box AF, Assistant Commissioner for Patents,  
 Washington, D.C. 20231

Keith A. Johnson

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF	:	Michael J. Sullivan
FOR	:	IMPROVED MULTI-LAYER GOLF BALL
SERIAL NO.	:	08/870,585
FILED	:	June 6, 1997
GROUP ART UNIT	:	3711
EXAMINER	:	M. Graham
LAST OFFICE ACTION	:	June 28, 2000
ATTORNEY DOCKET NO.	:	SLD 2 0035-3-3-1 P-3724-1-F1

Cleveland, Ohio 44114-2518  
 October 16, 2000

**AFTER FINAL RESPONSE**

Box AF  
 Assistant Commissioner for Patents  
 Washington, D.C. 20231

Dear Sir:

This is in response to the FINAL Office Action mailed June 28, 2000. Applicant respectfully requests that the present Response be considered in light of the FINAL Office Action.

REMARKS

In the FINAL Office Action mailed June 28, 2000, the Examiner rejected claims 1-6 under 35 U.S.C. § 103(a) as obvious over *Nesbitt* in view of *Nakamura*. The Examiner then provisionally rejected claims 1-6 for obviousness-type double patenting over claims 1-8 of co-pending application 08/920,070. Also, the Examiner alleged that the Information Disclosure Statement filed March 27, 2000 failed to comply with 37 C.F.R. § 1.97(c) and 37 C.F.R. § 1.98(a)(2).

Applicant herein presents clarifying remarks and respectfully submits that claims 1-6 are in condition for allowance.

**I. CLAIMS 1-6 ARE NOT OBVIOUS OVER *NESBITT* IN VIEW OF *NAKAMURA***

The Examiner rejected claims 1-6 under 35 U.S.C. § 103(a) as obvious over *Nesbitt* in light of *Nakamura*.

The present claims recite a second or outer layer or ply in the multi-layered golf balls comprised of a comparatively softer, *non-ionomer* *thermoplastic* or *thermosetting elastomer* such as *polyurethane*, a *polyester elastomer* or a *polyesteramide*. Preferably, the inner layer or ply includes a blend of low acid ionomers and has a Shore D hardness of 60 or more and the outer cover layer comprises a polyurethane and has a Shore D hardness of about 45. The multi-layer golf balls of the invention can be of standard or enlarged size. The combination of *Nesbitt* in light of *Nakamura* neither teach nor suggest an outer cover layer of a three-piece ball having a non-ionomer thermoplastic or thermosetting elastomer as recited in the present claims.

*Nesbitt*, the Examiner's primary reference, discloses a multi-layer golf ball which is produced by initially molding a first cover layer on a spherical core and then adding a second layer. The first layer is comprised of a hard, high flexural modulus resinous material such as type 1605 Surlyn® (now designated Surlyn® 8940). Type 1605 Surlyn® (Surlyn® 8940) is a sodium ion based low acid (less than or equal to 15 weight percent methacrylic acid) ionomer resin having a flexural modulus of about 51,000 psi. An outer layer of a comparatively

soft, low flexural modulus resinous material such as type 1855 Surlyn® (now designated Surlyn® 9020) is molded over the inner cover layer. Type 1855 Surlyn® (Surlyn® 9020) is a zinc ion based low acid (10 weight percent methacrylic acid) ionomer resin having a flexural modulus of about 14,000 psi.

The *Nesbitt* reference teaches that the hard, high flexural modulus resin which comprises the first layer provides for a gain in coefficient of restitution over the coefficient of restitution of the core. The relatively soft, low flexural modulus outer layer provides essentially no gain in the coefficient of restitution but provides for the advantageous "feel" and playing characteristics of a balata covered golf ball.

Unfortunately, however, while the balls shown in the examples of *Nesbitt* do exhibit some enhanced playability characteristics with slightly improved distance (i.e., enhanced C.O.R. values) over a number of other known multi-layered balls, the balls suffer from poor cut resistance and relatively short distance (i.e., lower C.O.R. values) when compared to two-piece, unitary cover layer balls. These undesirable properties make the ball produced in accordance with the specific examples of *Nesbitt* unacceptable by today's standards.

The present claims recite a multi-layer golf ball having a hard, low acid, inner layer and an outer layer of a relatively soft, non-ionomeric elastomer such as a polyurethane, a polyester elastomer or a polyester amide. As more particularly indicated in Example 4, use of non-ionomeric elastomers (Formulations 23-25) to produce the outer cover layer results in molded golf balls having softer compression, improved durability, higher spin, with similar C.O.R. values. The data indicates that a very good multi-layer ball can be made using non-ionomeric elastomers (i.e., polyurethane, etc.) as the material for the outer cover layers.

In addition, this application is directed to both standard size and oversize ball embodiments.

Furthermore, *Nakamura*, the Examiner's secondary reference, merely relates to a two-piece golf ball having a unitary cover comprised of a lithium neutralized ionomer resin having a Shore D hardness of at least 60. *Nakamura* is not directed to multi-layer golf ball technology and/or golf balls

having a soft, non-ionomeric elastomer outer cover and fails to address the particular characteristics of such a ball.

Lastly, an increase in cover thickness does not necessarily result in an increase in durability. Moreover, increasing the cover thickness of a multi-layered golf ball also effects such properties as weight, spin, C.O.R. (distance), compression, etc. As noted in the application, properties such as weights, etc. are strictly limited by the U.S.G.A. Thus, one can not merely increase the cover thickness to obtain enhanced durability of a regulation golf ball.

If one followed the teachings of the *Nesbitt* patent, one would be motivated to use an ionomeric material for the outer cover layer. See col. 2, lines 45-47 and col. 3, lines 35-40. That is directly opposite from the recitation in all pending claims that the outer cover layer comprise a non-ionomeric material. *Nakamura* fails to remedy the deficiencies of the *Nesbitt* patent. In fact, the *Nakamura* patent would also lead one away from the subject matter of the pending claims since *Nakamura* instructs that an ionomeric material be utilized for the outer cover layer. See col. 1, lines 5-6 and 40-43 for instance.

Consequently, Applicant respectfully submits that the present claims 1-6 are not merely a combination of the teaching of *Nesbitt* and *Nakamura*. Furthermore, the combination of *Nesbitt* and *Nakamura* will not result in the recited features of the present claims. Thus, reconsideration of the rejection of claims 1-6 is respectfully requested.

## II. OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTION

Upon allowance of claims 1-6, Applicant will submit one or more Terminal Disclaimers, as may be necessary, in one or both of the co-pending applications cited by the Examiner, U.S. Patent Application Serial Nos. 08/920,070 and 08/926,246 upon the indication of allowable subject matter.

## III. INFORMATION DISCLOSURE STATEMENT

The Examiner contended that the Information Disclosure Statement filed on March 27, 2000 failed to comply with 37 C.F.R. § 1.97(c) because it lacks a statement as specified in 37 C.F.R. § 1.97(e) and lacks a fee set forth in 37

C.F.R. § 1.17(p). Additionally, the Examiner stated that the Information Disclosure Statement failed to comply with 37 C.F.R. § 1.98(a)(2) requiring a legible copy of each U.S. and foreign patent; each publication which caused it to be listed; and all other information which caused it to be listed.

Under 37 C.F.R. § 1.97(c), Applicant, when filing an Information Disclosure Statement after the initial three-month period but before the final Office Action or notice of allowance, may either file a statement as specified under 37 C.F.R. § 1.97(e) or file the appropriate fee set forth in 37 C.F.R. § 1.17(p). Applicant submits that the proper fee of \$240.00 under 37 C.F.R. § 1.17(p) was submitted with the Information Disclosure Statement mailed on March 22, 2000. Applicant has fulfilled the requirement under 37 C.F.R. § 1.97(c) by paying the appropriate fee of \$240.00. Enclosed are copies of each of the following documents: (1) a copy of the Information Disclosure Statement, (2) a check stub, (3) a copy of the cancelled check, and (4) the filing receipt acknowledged by the U.S. Patent and Trademark Office on March 27, 2000, which are attached as Tab A. Applicant respectfully submits that if the U.S. Patent and Trademark Office did not receive the proper fee set forth in 37 C.F.R. § 1.17(p), that the appropriate amount be deducted from Deposit Account No. 06-0308. Therefore, Applicant respectfully submits that the requirements of 37 C.F.R. § 1.97(c) have been met.

Additionally, Applicant submits that copies of the references noted in the Information Disclosure Statement can be found in one or more of the prior applications from which the present application claims priority from, including U.S. Patent Application Serial Nos. 08/556,237 and 08/070,510. If any references cited are not found in the previous Information Disclosure Statement, Applicant shall provide a new copy of those references.

#### CONCLUSION

In view of the foregoing, Applicant respectfully submits that claims 1-6 are in condition for allowance. Applicant respectfully requests early notification of such allowance.

Respectfully submitted,

FAY, SHARPE, FAGAN,  
MINNICH & McKEE, LLP

DATED: October 1, 2000

Richard M. Klein

Richard M. Klein

Reg. No. 33,000

Mark E. Bandy

Reg. No. 35,788

1100 Superior Avenue, Seventh Floor

Cleveland, Ohio 44114-2518

Telephone: (216) 861-5582

Facsimile: (216) 241-1666

A

**CW 0300539**

## PATENT

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF : Michael J. Sullivan  
 FOR : IMPROVED MULTI-LAYER GOLF BALL  
 SERIAL NO. : 08/870,585  
 FILED : June 6, 1997  
 ART UNIT : 3711  
 EXAMINER : M. Graham  
 LAST OFFICE ACTION : December 7, 1999  
 ATTORNEY DOCKET NO. : SLD 2 035-3-3-1  
 P-3724-2-F1

Cleveland, Ohio 44114  
 March 21, 2000

Assistant Commissioner for Patents  
 Washington, D.C. 20231

## INFORMATION DISCLOSURE STATEMENT

Dear Sir:

Applicants submit herewith patents, publications or other information of which they are aware, which they believe may be material to the examination of the above-identified application and in respect of which there may be a duty to disclose in accordance with 37 C.F.R. 1.56.

This Information Disclosure Statement is not intended to constitute an admission that any patent, publication or other information referred to herein or submitted herewith is "prior art" for this invention unless specifically designated as such.

In accordance with 37 C.F.R. 1.97(g) and (h), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 C.F.R. 1.56(b) exists.

Copies of the references listed on enclosed Form PTO-1449 are enclosed.

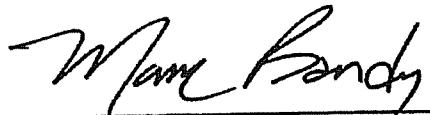
I hereby certify that correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Assistant Commissioner for Patents, Washington, DC 20231, on 3/23/00.

Mary Ann Ternavasio  
 (SIGNATURE)

It is respectfully requested that the attached documents be considered  
and officially cited in examination of this application.

Respectfully submitted,

FAY, SHARPE, FAGAN,  
MINNICH & McKEE, LLP



Richard M. Klein  
Reg. No. 33,000  
Mark E. Bandy  
Reg. No. 35,788  
1100 Superior Avenue  
Suite 700  
Cleveland, Ohio 44114-2518  
(216) 861-5582

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FAY, SHARPE, FAGAN, MINNICH & McKEE, LLP				
DATE	INVOICE NO. OR REFERENCE	AMOUNT	DISCOUNT	CHECK #
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PLEASE DETACH STATEMENT BEFORE DEPOSITING CHECK

CW 0300542

FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP  
1100 SUPERIOR AVENUE, SEVENTH FLOOR  
CLEVELAND, OH 44114-2518

DATE

8/21/2006

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FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP

AUTHORIZED SIGNATURE

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PATENT AND TRADEMARK OFFICE  
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03-28-2000  
FOR CREDIT TO THE  
U.S. TREASURY

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CLEVELAND, OH 44114-2518  
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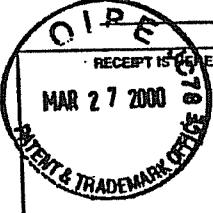
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Inventor/Applicant: <b>Sullivan</b> Title: <b>IMPROVED MULTI-LAYER GOLF BALLS</b> Attorney Docket No. <b>SLD 2035-3-3-1</b> Initials: <b>MM</b>	Pat. No. <b>08/870,572</b> Ser. No. <b>08/870,572</b> Filed <b>6/6/97</b> Date <b>3/22/00</b>	NO.
<input checked="" type="checkbox"/> <b>PATENT/DESIGN APPLICATION</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> New Application Transmitted</li> <li><input type="checkbox"/> Cont. <input type="checkbox"/> Div. <input type="checkbox"/> C-I-P</li> <li><input type="checkbox"/> Declaration/Power of Atty.</li> <li><input type="checkbox"/> pgs. Specification</li> <li><input type="checkbox"/> pgs. Claims</li> <li><input type="checkbox"/> total <input type="text"/> independent</li> <li><input type="checkbox"/> pgs. Abstract</li> <li><input type="checkbox"/> Sheet(s) of drawing(s)</li> <li><input type="checkbox"/> formal <input type="text"/> informal</li> <li><input type="checkbox"/> Preliminary Amendment</li> <li><input type="checkbox"/> Claim for Right of Priority</li> <li><input type="checkbox"/> Priority document(s)</li> <li><input type="checkbox"/> Small Entity Statement</li> <li><input type="checkbox"/> Final Fee</li> <li><input type="checkbox"/> Response to missing parts</li> </ul>		
<input type="checkbox"/> <b>AMENDMENT (Due <input type="text"/>)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Transmitted(s)</li> <li><input type="checkbox"/> Extension of Time (For <input type="text"/> month(s))</li> </ul>		
<input type="checkbox"/> <b>OTHER</b> <input type="text"/>		
 <div style="display: flex; justify-content: space-around; width: 100%;"> <div style="text-align: center;"> <b>RECEIPT IS HEREBY ACKNOWLEDGED</b>  <b>MAR 27 2000</b> </div> <div style="text-align: center;"> <b>U.S. PATENT &amp; TRADEMARK OFFICE</b> </div> </div>		
<input type="checkbox"/> <b>ASSIGNMENT</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Transmittal <input type="text"/> Confirmatory</li> </ul>		
<input checked="" type="checkbox"/> <b>INFORMATION DISCLOSURE STATEMENT</b> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> PTO Form 1449 <b>124</b> Refs.</li> </ul>		
<input checked="" type="checkbox"/> <b>CHECK(S) IN AMOUNT \$ <b>240.</b></b>		

"Express Mail" Mailing Label No. EL581518940US  
Date of Deposit: October 18, 2000  
I hereby certify that this paper or fee is  
being deposited with the United States  
Postal Service "Express Mail Post Office to  
Addressee" service under 37 C.F.R. 1.10 on  
the date indicated above and is addressed  
to: Box AF, Assistant Commissioner for Patents,  
Washington, D.C. 20231

Keith A. Johnson

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF	:	Michael J. Sullivan
FOR	:	IMPROVED MULTI-LAYER GOLF BALL
SERIAL NO.	:	08/870,585
FILED	:	June 6, 1997
GROUP ART UNIT	:	3711
EXAMINER	:	M. Graham
LAST OFFICE ACTION	:	June 28, 2000
ATTORNEY DOCKET NO.	:	SLD 2 0035-3-3-1 P-3724-1-F1

Cleveland, Ohio 44114-2518  
October 18, 2000

**REQUEST FOR A ONE-MONTH EXTENSION OF TIME**

Assistant Commissioner for Patents  
Washington, DC 20231

Dear Sir:

The initial period for response to the Official Action mailed June 28, 2000  
expired on September 28, 2000.

Pursuant to 37 C.F.R. 1.17 petition is hereby made for a one-month  
extension of time up to and including October 30, 2000 (October 28, 2000 is a

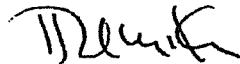
- 2 -

**Saturday)** in which to respond to the Official Action. A check in the amount of **\$110.00** for the extension fee is enclosed herewith.

Authorization is hereby provided to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0308.

Respectfully Submitted,

FAY, SHARPE, FAGAN,  
MINNICH & McKEE, LLP



---

Richard M. Klein  
Reg. No. 33,000  
Mark E. Bandy  
Reg. No. 35,788  
1100 Superior Avenue, 7th Floor  
Cleveland, Ohio 44114-2518  
Telephone: (216) 861-5582  
Facsimile: (216) 241-1666

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**CW 0300546**



P-3724-2-F1

UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

KR

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/870,585	06/06/97	SULLIVAN	M SLD-2-035-3-

024492 QM22/1025  
SPALDING SPORTS WORLDWIDE INC  
425 MEADOW STREET  
PO BOX 901  
CHICOPEE MA 01021-0901

EXAMINER  
GRAHAM, M

ART UNIT	PAPER NUMBER
3711	19

DATE MAILED: 10/25/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

OCT 30 2000

JF

CC:TR

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CW 0300547

**Advisory Action**

Application No. 08/870,585	Applicant(s) Sullivan
Examiner Mark S. Graham	Group Art Unit 3711

**THE PERIOD FOR RESPONSE: [check only a) or b)]**

a)  expires 4 months from the mailing date of the final rejection.

b)  expires either three months from the mailing date of the final rejection, or on the mailing date of this Advisory Action, whichever is later. In no event, however, will the statutory period for the response expire later than six months from the date of the final rejection.

Any extension of time must be obtained by filing a petition under 37 CFR 1.136(a), the proposed response and the appropriate fee. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for the purposes of determining the period of extension and the corresponding amount of the fee. Any extension fee pursuant to 37 CFR 1.17 will be calculated from the date of the originally set shortened statutory period for response or as set forth in b) above.

Appellant's Brief is due two months from the date of the Notice of Appeal filed on \_\_\_\_\_ (or within any period for response set forth above, whichever is later). See 37 CFR 1.191(d) and 37 CFR 1.192(a).

Applicant's response to the final rejection, filed on Oct 18, 2000 has been considered with the following effect, but is NOT deemed to place the application in condition for allowance:

The proposed amendment(s):

will be entered upon filing of a Notice of Appeal and an Appeal Brief.  
 will not be entered because:

they raise new issues that would require further consideration and/or search. (See note below).  
 they raise the issue of new matter. (See note below).  
 they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal.  
 they present additional claims without cancelling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_

Applicant's response has overcome the following rejection(s): \_\_\_\_\_

Newly proposed or amended claims \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment cancelling the non-allowable claims.

The affidavit, exhibit or request for reconsideration has been considered but does NOT place the application in condition for allowance because: of the reasons set forth in the previous action.

The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

For purposes of Appeal, the status of the claims is as follows (see attached written explanation, if any):  
 Claims allowed: \_\_\_\_\_

Claims objected to: \_\_\_\_\_

Claims rejected: 1-6

The proposed drawing correction filed on \_\_\_\_\_ has  has not been approved by the Examiner.

Note the attached Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

Other

  
MARK S. GRAHAM  
PRIMARY EXAMINER  
ART UNIT 3711

**PATENT****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF : Sullivan  
 FOR : IMPROVED MULTI-LAYER  
 GOLF BALL  
 SERIAL NO. : 08/870,585  
 FILED : June 6, 1997  
 ART UNIT : 3711  
 EXAMINER : M. Graham  
 LAST OFFICE ACTION : June 28, 2000  
 ATTORNEY DOCKET NO. : P-3724-1-F1  
 (SLD 2 0035-3-3-1)

Cleveland, Ohio 44114-2518  
 December 5, 2000

**NOTICE OF APPEAL FROM THE PRIMARY EXAMINER TO THE  
 BOARD OF PATENT APPEALS AND INTERFERENCES**

Assistant Commissioner for Patents  
 Washington, D.C. 20231  
 Box: AF

Applicant hereby appeals to the Board from a decision of the  
 primary Examiner mailed June 28, 2000 finally rejecting claims 1-6.

The items checked below are appropriate:

**1. STATUS OF APPLICANT**

This application is on behalf of other than a small entity.

CERTIFICATE OF MAILING

I hereby certify that this NOTICE OF APPEAL is being  
 deposited with the United States Postal Service as  
 first class mail in an envelope addressed to:  
 Assistant Commissioner for Patents,  
 Washington, D.C. 20231 on Dec. 7, 2000.

By: Mary Ann Temesvari  
 Mary Ann Temesvari

- 2 -

**2. FEE FOR FILING NOTICE OF APPEAL**

Pursuant to 37 C.F.R. 1.17(e) the fee for filing the Notice of

Appeal is:

<input checked="" type="checkbox"/>	other than a small entity	\$310.00
<input type="checkbox"/>	small entity	\$155.00

**3. EXTENSION OF TERM**

Request for Extension of Time with required fee is attached.

**4. TOTAL FEES DUE**

The total fee due is:

Notice of Appeal Fee:	\$310.00
Extension of Time Fee:	\$390.00

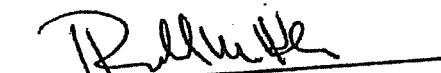
**5. FEE PAYMENT**

Attached is a check in the total amount of \$700.00

If any additional extension and/or fee is required this is a request  
therefor and charge Account No. 06-0308.

Respectfully Submitted,

FAY, SHARPE, FAGAN,  
MINNICH & MCKEE, LLP



Richard M. Klein  
Reg. No. 33,000  
Mark E. Bandy  
Reg. No. 35,788  
1100 Superior Avenue, 7th Floor  
Cleveland, Ohio 44114-2518  
(216) 861-5582

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of : Michael J. Sullivan  
For : IMPROVED MULTI-LAYER GOLF BALL  
Serial No. : 08/870,585  
Filed : June 6, 1997  
Group Art Unit : 3711  
Examiner : M. Graham  
Last Office Action : June 28, 2000  
Attorney Docket No. : P3724-1-F1  
(SLD 2 0035-3-3-1)

Cleveland, Ohio 44114-2518  
November 13, 2000

**REQUEST FOR A TWO-MONTH EXTENSION OF TIME**

Assistant Commissioner for Patents  
Washington, DC 20231

Dear Sir:

The initial period for response to the Official Action mailed June 28, 2000 expired on September 28, 2000. A one-month extension of time was filed and paid for on October 16, 2000 up to and including October 30, 2000.

Pursuant to 37 C.F.R. 1.17 petition is hereby made for a two-month extension of time up to and including December 28, 2000 in which to file the enclosed Notice of Appeal. A check including the amount of \$390.00 for the extension fee is enclosed herewith.

Authorization is hereby provided to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0308.

**CERTIFICATE OF MAILING**

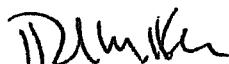
I hereby certify that this Request for Two-Month Extension of Time is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on 10/17/00

By: Mary Ann Temesvari  
Mary Ann Temesvari

- 2 -

Respectfully Submitted,

FAY, SHARPE, FAGAN,  
MINNICH & McKEE, LLP

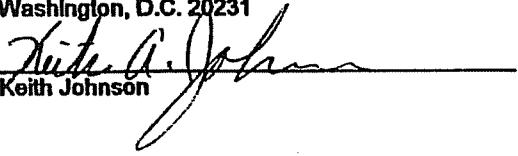


Richard M. Klein  
Reg. No. 33,000  
Mark E. Bandy  
Reg. No. 35,788  
1100 Superior Avenue, Suite 700  
Cleveland, Ohio 44114-2518  
(216) 861-5582

"Express Mail" Mailing Label No. EL630710957US

Date of Deposit: December 18, 2000

I hereby certify that this paper or fee is  
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Addressee" service under 37 C.F.R. 1.10 on  
the date indicated above and is addressed  
to the Assistant Commissioner for Patents,  
Washington, D.C. 20231

  
Keith Johnson

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF	:	Michael J. Sullivan
FOR	:	IMPROVED MULTI-LAYER GOLF BALL
SERIAL NO.	:	08/870,585
FILED	:	June 6, 1997
ART UNIT	:	3711
EXAMINER	:	M. Graham
LAST OFFICE ACTION	:	June 28, 2000
ATTORNEY DOCKET NO.	:	SLD 2 035-3-3-1 P-3724-2-F1

Cleveland, Ohio 44114  
December 15, 2000

Assistant Commissioner for Patents  
Washington, D.C. 20231

**INFORMATION DISCLOSURE STATEMENT**

Dear Sir:

Applicants submit herewith patents, publications or other information of which they are aware, which they believe may be material to the examination of the above-identified application and in respect of which there may be a duty to disclose in accordance with 37 C.F.R. 1.56.

This Information Disclosure Statement is not intended to constitute an admission that any patent, publication or other information referred to herein or submitted herewith is "prior art" for this invention unless specifically designated as such.

In accordance with 37 C.F.R. 1.97(g) and (h), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 C.F.R. 1.56(b) exists.

Applicant respectfully submits that the fee of \$240.00 required under 37 C.F.R. § 1.97(c) was submitted with the Information Disclosure Statement of March 22, 2000, wherein the same references cited in that Information Disclosure Statement are also currently cited.

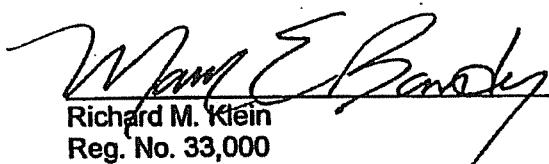
Copies of the references listed on enclosed Form PTO-1449 are enclosed.

It is respectfully requested that the attached documents be considered and officially cited in the examination of this application.

Respectfully submitted,

FAY, SHARPE, FAGAN,  
MINNICH & McKEE, LLP

DATED: December 18, 2000



Richard M. Klein  
Reg. No. 33,000  
Mark E. Bandy  
Reg. No. 35,788  
1100 Superior Avenue, Seventh Floor  
Cleveland, Ohio 44114-2518  
(216) 861-5582

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Subst. Form PTO-1449		Atty. Docket No.: SLD 2 035-3-3-1 P-3724-2-F1		Serial No.: 08/870,585			
APPLICANT'S(S') INFORMATION DISCLOSURE STATEMENT Page 1 of 10		Applicants: Sullivan					
		Filing Date: June 6, 1997		Group: 3711			
<b>U.S. PATENT DOCUMENTS</b>							
Initial*	Document No.	Date	Name	Class	Subcl.	Filing Date	
	2,741,480	04/1953	Smith				
	2,973,800	09/1958	Muccino				
	3,053,539	06/1959	Piechowski				
	3,264,272	08/1966	Rees				
	3,313,545	09/1963	Bartsch				
	3,373,123	03/1968	Brice				
	3,384,612	05/1968	Brandt et al.				
	3,395,109	07/1968	Molitor et al.				
	3,458,205	04/1965	Smith et al.				
	3,502,338	03/1970	Cox				
	3,534,965	10/1970	Harrison et al.				
	3,572,721	03/1971	Harrison et al.				
	3,883,145	05/1975	Cox et al.				
	3,979,126	09/1976	Dusbiber				
	3,989,568	11/1976	Isaac				
<b>FOREIGN PATENT DOCUMENTS</b>							
	Document No.	Date	Country	Class	Subcl.	Translation?	
	494,031	10/1938	GB				
	2,245,580	01/1992	GB				
	2,248,067	03/1992	GB				
	2,264,302	11/1992	GB				
	2,291,811	1996	GB				
<b>OTHER ART</b>							
	A General Reference Manual, "The Chemistry of Polyurethane Coatings," Mobay Corporation, 1-16 (1986)						
	Product Announcement, "New Polyurea System Offering Rapid Mold Times and Excellent Thermal Stability for Automotive Fascias Is Introduced by Mobay," PRNewswire, March 1, 1998						
	Cytec Industries, Inc., "TMXDI®(META) Aliphatic Isocyanates," brochure, pp. 2-11, 9/94						
	Bayer Corporation, "Engineering Polymers RIM and Part Mold Design," brochure, pp. 1-85, 5/95						
Examiner:		Date Considered:					
<ul style="list-style-type: none"> <li>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if in conformance and not considered. Include copy of this form with next communication to applicant.</li> </ul>							

<b>Subst. Form PTO-1449</b> <b>APPLICANT'S(S') INFORMATION</b> <b>DISCLOSURE STATEMENT</b> Page 2 of 10		Atty. Docket No.: SLD 2 035-3-3-1 P-3724-2-F1		Serial No.: 08/870,585			
		Applicants: Sullivan					
		Filing Date: June 6, 1987		Group: 3711			
		<b>U.S. PATENT DOCUMENTS</b>					
Initial*		Document No.	Date	Name	Class	Subcl.	Filing Date
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		Document No.	Date	Country	Class	Subcl.	Translation?
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		0,589,647	1993	EP Patent Application			
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<b>OTHER ART</b>							
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Examiner:				Date Considered:			
EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if in conformance and not considered. Include copy of this form with next communication to applicant.							

Subst. Form PTO-1449		Atty. Docket No.: SLD 2 035-3-3-1 P-3724-2-F1		Serial No.: 08/870,585		
APPLICANT(S) INFORMATION DISCLOSURE STATEMENT Page 3 of 10		Applicants: Sullivan				
		Filing Date: June 6, 1997			Group: 3711	
<b>U.S. PATENT DOCUMENTS</b>						
Initial*	Document No.	Date	Name	Class	Subcl.	Filing Date
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<b>FOREIGN PATENT DOCUMENTS</b>						
	Document No.	Date	Country	Class	Subcl.	Translation?
<b>OTHER ART</b>						
	Translated Claims for JP 1,795,357 publ. 1/19/93					
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	ESCOR ACID TERPOLYMERS, EXXON Chemical Co.					
	Translated Claims for JP 1,771,941 publ. 8/6/92					
Examiner:	Date Considered:					
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if in conformance and not considered. Include copy of this form with next communication to applicant.						

Subst. Form PTO-1449		Atty. Docket No.: SLD 2 035-3-3-1 P-3724-2-F1		Serial No.: 08/870,585		
APPLICANT(S) INFORMATION DISCLOSURE STATEMENT Page 4 of 10		Applicants: Sullivan				
		Filing Date: June 6, 1997 Group: 3711				
<b>U.S. PATENT DOCUMENTS</b>						
Initial*	Document No.	Date	Name	Class	Subcl.	Filing Date
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<b>FOREIGN PATENT DOCUMENTS</b>						
	Document No.	Date	Country	Class	Subcl.	Translation?
<b>OTHER ART</b>						
Examiner:					Date Considered:	
<ul style="list-style-type: none"> <li>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 608; Draw line through citation if in conformance and not considered. Include copy of this form with next communication to applicant.</li> </ul>						

Subst Form PTO-1448		Atty. Docket No.: SLD 2 035-3-3-1 P-3724-2-F1		Serial No.: 08/870,585			
APPLICANT(S)' INFORMATION DISCLOSURE STATEMENT Page 5 of 10		Applicants: Sullivan					
		Filing Date: June 6, 1997		Group: 3711			
<b>U.S. PATENT DOCUMENTS</b>							
Initial*		Document No.	Date	Name	Class	Subcl.	Filing Date
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<b>FOREIGN PATENT DOCUMENTS</b>							
		Document No.	Date	Country	Class	Subcl.	Translation?
<b>OTHER ART</b>							
Examiner:						Date Considered:	
EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if in conformance and not considered. Include copy of this form with next communication to applicant.							

**Examiner:**

**Date Considered:**

- EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if in conformance and not considered. Include copy of this form with next communication to applicant.

Subst. Form PTO-1449		Atty. Docket No.: SLD 2 035-3-3-1 P-3724-2-F1		Serial No.: 08/870,585		
APPLICANT(S)' INFORMATION DISCLOSURE STATEMENT Page 6 of 10		Applicants: Sullivan				
		Filing Date: June 6, 1997 Group: 3711				
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	Document No.	Date	Country	Class	Subcl.	Translation?
<b>OTHER ART</b>						
Examiner:				Date Considered:		
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<b>Subst. Form PTO-1449</b>  <b>APPLICANT(S) INFORMATION</b> <b>DISCLOSURE STATEMENT</b> Page 7 of 10		Atty. Docket No.: SLD 2 035-3-3-1 P-3724-2-F1		Serial No.: 08/870,585		
		Applicants: Sullivan		Filing Date: June 6, 1997 Group: 3711		
<b>U.S. PATENT DOCUMENTS</b>						
Initial*	Document No.	Date	Name	Class	Subcl.	Filing Date
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<b>OTHER ART</b>						
Examiner:					Date Considered:	
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APPLICANT(S)' INFORMATION DISCLOSURE STATEMENT Page 8 of 10		Applicants: Sullivan				
		Filing Date: June 6, 1997		Group: 3711		
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Initial*	Document No.	Date	Name	Class	Subcl.	Filing Date
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	Document No.	Date	Country	Class	Subcl.	Translation?
<b>OTHER ART</b>						
Examiner: _____						Date Considered: _____
<ul style="list-style-type: none"> <li>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if in conformance and not considered. Include copy of this form with next communication to applicant.</li> </ul>						

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APPLICANT(S) INFORMATION DISCLOSURE STATEMENT Page 9 of 10		Applicants: Sullivan				
		Filing Date: June 6, 1997		Group: 3711		
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	Document No.	Date	Country	Class	Subcl.	Translation?
<b>OTHER ART</b>						
Examiner:					Date Considered:	
<ul style="list-style-type: none"> <li>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if in conformance and not considered. Include copy of this form with next communication to applicant.</li> </ul>						

Subst. Form PTO-1449  APPLICANT(S) INFORMATION DISCLOSURE STATEMENT Page 10 of 10		Atty. Docket No.: SLD 2 035-3-3-1 P-3724-2-F1	Serial No.: 08/870,585			
		Applicants: Sullivan				
		Filing Date: June 6, 1997	Group: 3711			
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Please type a plus sign (+) here: +

**ASSOCIATE POWER OF ATTORNEY**      ] Application Serial No. 08/870,585  
**PATENT APPLICATION**                  ] Filing Date:                  June 6, 1997  
    ] Inventor(s):                  Michael J. Sullivan  
**Address to:**                          ] Group Art Unit:                  3711  
**Assistant Commissioner for Patents**      ] Examiner:                          M. Graham  
**Washington, DC 20231**                  ] Attorney Docket No.: P-3724-2-F1

Dear Sir:

Please recognize the following associates in the above-referenced patent application as follows:

Patent Office  
Registration No.

Richard M. Klein, Esq.                  33,000  
 Mark E. Bandy, Esq.                  35,788

The associates listed above can be reached at:

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If you have any questions, please contact me.

Respectfully submitted,

Customer No. 24492  
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 DFC/ijn

Date: 2/1/01

By Diane F. Covello  
 Diane F. Covello, Esq., Reg. No. 34,164  
 Michelle Bugbee, Reg. No. 42,370  
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 Chicopee, MA 01021-0901



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

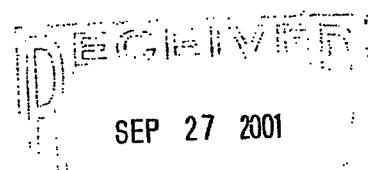
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/670, 585	06/06/97	SULLIVAN	M SLD-2-035-3- P-3724-Z-F1
		EXAMINER	
024492		0M22/0925	
MICHELLE BUGBEE, ASSOCIATE PATENT COUNSEL		GRAHAM, M	
SPALDING SPORTS WORLDWIDE INC		ART UNIT	PAPER NUMBER
425 MEADOW STREET		3711	
PO BOX 961		DATE MAILED:	
CHICOPEE MA 01021-0961		09/25/01	

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks



**Notice of Abandonment**

Application No. 08/870,585	Applicant(s) Sullivan
Examiner Mark S. Graham	Art Unit 3711

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

This application is abandoned in view of:

1.  Applicant's failure to timely file a proper reply to the Office letter mailed on Jun 28, 2000.
  - (a)  A reply was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply (including a total extension of time of \_\_\_\_\_ month(s)) which expired on \_\_\_\_\_.
  - (b)  A proposed reply was received on Oct 18, 2000, but it does not constitute a proper reply under 37 CFR 1.113(a) to the final rejection.
 

(A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
  - (c)  No response has been received.
2.  Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
  - (a)  The issue fee and publication fee, if applicable, was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance.
  - (b)  The submitted issue fee of \$ \_\_\_\_\_ is insufficient. A balance of \$ \_\_\_\_\_ is due.
 

The issue fee required by 37 CFR 1.18 is \$ \_\_\_\_\_. The publication fee, if required by 37 CFR 1.18(d) is \$ \_\_\_\_\_.
  - (c)  The issue fee and publication fee, if applicable, has not been received.
3.  Applicant's failure to timely file new formal drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
  - (a)  Proposed new formal drawings were received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply.
  - (b)  The proposed new formal drawings filed on \_\_\_\_\_ are not acceptable and the period for reply has expired.
  - (c)  No proposed new formal drawings have been received.
4.  The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5.  The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6.  The decision by the Board of Patent Appeals and Interferences rendered on \_\_\_\_\_ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7.  The reason(s) below:

MARK S. GRAHAM  
PRIMARY EXAMINER  
ART UNIT 3711

# EXHIBIT 2

## United States Patent [19]

Nesbitt

[11]

4,431,193

[45]

Feb. 14, 1984

[54] GOLF BALL AND METHOD OF MAKING  
SAME

[75] Inventor: R. Dennis Nesbitt, Westfield, Mass.

[73] Assignee: Questor Corporation, Tampa, Fla.

[21] Appl. No.: 296,146

[22] Filed: Aug. 25, 1981

[51] Int. Cl.<sup>3</sup> ..... A63B 37/12[52] U.S. Cl. ..... 273/235 R; 273/218;  
273/DIG. 22[58] Field of Search ..... 273/235 R, 225, 218,  
273/214, 217, DIG. 8, DIG. 22

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4,274,637	6/1981	Molitor	273/DIG. 8 X

Primary Examiner—George J. Marlo

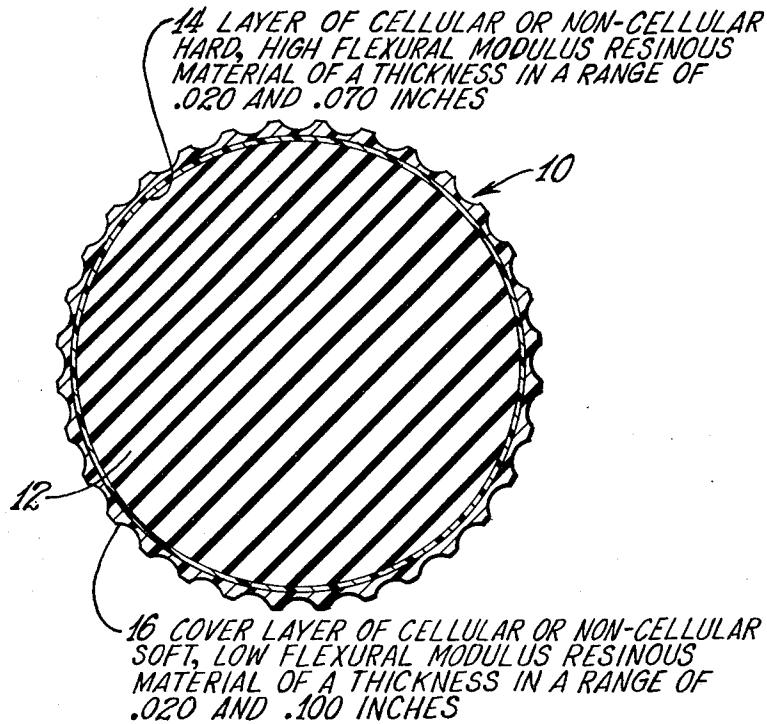
*Attorney, Agent, or Firm*—Harry O. Ernsberger; Donald R. Bahr

[57]

## ABSTRACT

The disclosure embraces a golf ball and method of making same wherein the golf ball has a solid (not thread-wound) resilient center or core, and a multilayer cover construction which involves a first layer or ply of molded hard, high flexural modulus resinous material on the core, and a second or cover layer of soft, low flexural modulus resinous material molded over the first layer to form a finished golf ball. The first layer is of a thickness in a range of 0.020 inches and 0.070 inches and may be of resinous material such as Type 1605 Surlyn marketed by E. I. du Pont de Nemours and Company, and the second or cover layer is of a thickness in a range of 0.020 inches and 0.100 inches and may be of resinous material such as Type 1855 Surlyn marketed by E. I. du Pont de Nemours and Company. Foamable materials for producing a cellular first layer or cellular cover layer are polymeric materials such as ionomer resins.

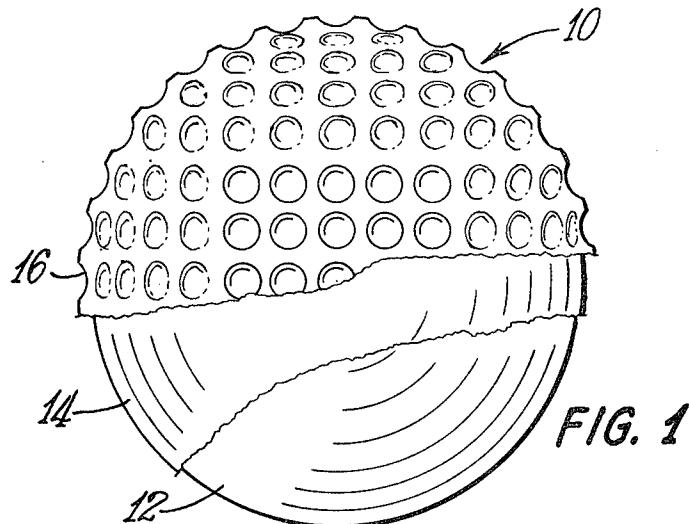
13 Claims, 2 Drawing Figures



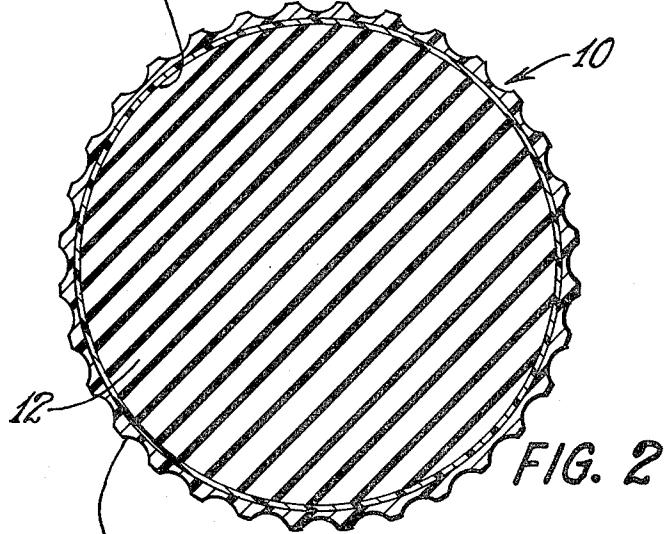
U.S. Patent

Feb. 14, 1984

4,431,193



14 LAYER OF CELLULAR OR NON-CELLULAR  
HARD, HIGH FLEXURAL MODULUS RESINOUS  
MATERIAL OF A THICKNESS IN A RANGE OF  
.020 AND .070 INCHES



16 COVER LAYER OF CELLULAR OR NON-CELLULAR  
SOFT, LOW FLEXURAL MODULUS RESINOUS  
MATERIAL OF A THICKNESS IN A RANGE OF  
.020 AND .100 INCHES

## GOLF BALL AND METHOD OF MAKING SAME

## TECHNICAL FIELD

The invention relates to a golf ball and more particularly to a cover construction for a golf ball.

## BACKGROUND ART

Golf balls having a cover material marketed under the trademark "Surlyn" by E. I. du Pont de Nemours and Company of Wilmington, Del., are known in the art and such cover compositions generally comprise a copolymer of an olefin and at least one unsaturated monocarboxylic acid. Conventional two-piece golf balls are comprised of a solid resilient center or core with molded Surlyn covers. The cover used is normally a hard, high flexural modulus Surlyn resin in order to produce a gain in the coefficient of restitution over that of the center or core.

In a conventional two-piece golf ball, a hard, high flexural modulus Surlyn resin is molded over a resilient center or core. The hard, highly flexural modulus Surlyn resin for the cover of a two-piece golf ball is desirable as it develops the greatest hoop stress and consequently the greatest coefficient of restitution.

A two-piece golf ball having a hard, Surlyn resin cover however does not have the "feel" or playing characteristics associated with softer balata covered golf balls. Heretofore balata covered golf balls have been preferred by most golf professionals. If a golf ball has a cover of soft, low flexural modulus Surlyn resin molded directly over a center or core, it is found that little or no gain in coefficient of restitution is obtained.

## DISCLOSURE OF THE INVENTION

In accordance with the present invention there is provided a golf ball having a multilayer or two-ply cover construction for a solid resilient center or core wherein the multilayer cover construction involves two stage molded cover compositions over a solid center or core of resilient polymeric material wherein an increased coefficient of restitution is attained and wherein the "feel" or playing characteristics are attained similar to those derived from a balata covered golf ball.

The invention embraces a golf ball and method of making same wherein the ball has a solid center or core of resilient polymeric or similar material covered by a first layer or ply of molded hard, highly flexural modulus resinous material or of cellular or foam composition which has a high coefficient of restitution.

The first layer or ply is provided with a second or cover layer of a comparatively soft, low flexural modulus resinous material or of cellular or foam composition molded over the first layer and core or center assembly. Such golf ball has the "feel" and playing characteristics simulating those of a softer balata covered golf ball.

Through the use of the first ply or layer of hard, high flexural modulus resinous material on the core or center, a maximum coefficient of restitution may be attained. The resinous material for the first ply or layer may be one type of Surlyn marketed by E. I. du Pont de Nemours and Company of Wilmington, Del., and the other ply or cover layer may be of a different type of Surlyn resin also marketed by the same company.

The three-piece golf ball of the invention provides a golf ball in which the coefficient of restitution of the golf ball closely approaches or attains that which provides the maximum initial velocity permitted by the

United States Golf Association Rules of two hundred fifty feet per second with a maximum tolerance of two percent, which velocity may be readily attained and the playing characteristics or "feel" associated with a balata covered ball secured while maintaining a total weight of the golf ball not exceeding 1.620 ounces without sacrificing any advantages of a golf ball having a standard Surlyn cover of the prior art or a golf ball having a softer balata cover.

Further objects and advantages are within the scope of this invention such as relate to the arrangement, operation and function of the related elements of the structure, to various details of construction and to combinations of parts, elements per se, and to economies of manufacture and numerous other features as will be apparent from a consideration of the specification and drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

The details of the invention will be described in connection with the accompanying drawings in which:

FIG. 1 is a view of a golf ball embodying the invention illustrating portions of the multiply or multilayer cover construction on a core or center, and

FIG. 2 is a diametrical cross sectional view of the golf ball of the invention.

## BEST MODE FOR CARRYING OUT THE INVENTION

Referring to the drawings in detail there is illustrated a golf ball 10 which comprises a solid center or core 12 formed as a solid body of resilient polymeric material or rubber-like material in the shape of a sphere. Disposed on the spherical center or core 12 is a first layer, lamination, ply or inner cover 14 of molded hard, highly flexural modulus resinous material such as type 1605 Surlyn marketed by E. I. du Pont de Nemours and Company, Wilmington, Del.

This material of the inner layer 14 being a hard, high flexural modulus resin produces a substantial gain of coefficient of restitution over the coefficient of restitution of the core or center. An outer layer, ply, lamination or cover 16 of comparatively soft, low flexural modulus resinous material such as type 1855 Surlyn marketed by E. I. du Pont de Nemours and Company is then re-molded onto the inner ply or layer 14, the outer surface of the outer layer or cover 16 being of dimpled configuration providing a finished three-piece golf ball.

According to the United States Golf Association Rules, the minimum diameter prescribed for a golf ball is 1.680 inches and the maximum weight prescribed for a golf ball is 1.620 ounces. It is therefore desirable to produce a golf ball having an improved coefficient of restitution to attain an initial velocity for the golf ball approaching the maximum velocity limit of 255 feet per second, the maximum limit provided by the United States Golf Association Rules.

The hard, high flexural modulus resin is employed to increase the coefficient of restitution in order to attain or approach the maximum initial velocity for the golf ball. The use of a soft low flexural modulus resin provides little or no gain in the coefficient of restitution and may tend to reduce the coefficient of restitution thereby adversely affecting the initial velocity factor.

In producing the golf ball of the invention, the density of the center or core may be varied and the relative thicknesses of the layers, plies or laminations 14 and 16

may be varied within limits so that the golf ball weight does not exceed 1.620 ounces, the minimum diameter not less than 1.680 inches, and the ball be capable of an initial velocity approaching 255 feet per second. However, the finished golf ball may be of larger diameter providing the total weight of the ball does not exceed 1.620 ounces.

Thus, by varying the density of the center or core 12 and varying the thicknesses of the plies or layers 14 and 16 of the cover construction, a golf ball may be produced having a total weight not exceeding 1.620 ounces and a minimum diameter of 1.680 inches and having a comparatively high coefficient of restitution, the ball closely approaching or attaining in play the maximum permitted initial velocity of 255 feet per second.

In the golf ball of the invention the thickness of the inner layer or ply 14 and the thickness of the outer layer or ply 16 may be varied to secure the advantages herein mentioned. It is found that the inner layer 14 of hard, high flexural modulus resinous material, such as Surlyn resin type 1605, is preferably of a thickness in a range of 0.020 inches and 0.070 inches. The thickness of the outer layer or cover 16 of soft, low flexural modulus resin, such as Surlyn type 1855, may be in a range of 0.020 inches and 0.100 inches.

For example, a center or core 12 having a 0.770 coefficient of restitution is molded with a layer of hard, high modulus Surlyn resin, such as Surlyn type 1605, to form a spherical body of a diameter of about 1.565 inches. This spherical body comprising the core or center 12 and layer 14 of the hard, high modulus Surlyn resin has a coefficient of restitution of 0.800 or more.

This center or core 12 and inner layer 14 of hard resinous material in the form of a sphere is then remolded into a dimpled golf ball of a diameter of 1.680 inches minimum with an outer or cover layer 16 of a soft, low flexural modulus resin such as Surlyn type 1855. The outer layer of the soft resin is of a thickness of 0.0575 inches. The soft Surlyn resin cover would have about the same thickness and shore hardness of a balata covered golf ball and would have the advantageous "feel" and playing characteristics of a balata covered golf ball.

It is to be understood that the golf ball of the invention may be made of a diameter greater than 1.680 inches without exceeding the total weight of 1.620 ounces by varying the thickness of the inner layer or ply 14 and the outer cover layer or ply 16 and secure desired "feel" and playing characteristics.

The inner, intermediate, or first layer or ply 14 and the outer cover, second layer or ply 16 or either of the layers may be cellular when formed of a foamed natural or synthetic polymeric material. Polymeric materials are preferably such as ionomer resins which are foamable. Reference is made to the application Ser. No. 155,658, of Robert P. Molitor issued into U.S. Pat. No. 4,274,637 which describes a number of foamable compositions of a character which may be employed for one or both layers 14 and 16 for the golf ball of this invention.

The inner, intermediate or first layer 14 on the core 12 may be preferably partially or only slightly foamed to a low degree so as not to materially affect the coefficient of restitution of the material. The outer or cover layer or second layer 16 may be foamed to a greater degree than the inner, intermediate or first layer 14 as the material of the layer 16 is comparatively soft.

The inner, intermediate or first layer 14 may be unfoamed or noncellular and the outer layer may be cellular or foamed resin. If certain characteristics are desired for the golf ball, the inner layer 14 may be slightly or partially foamed and the outer or cover layer or ply 16 may be of unfoamed or noncellular material.

Through the use of foamable material for the first layer, the cover layer or both layers, the degree of foaming of one or the other or both layers may be altered to provide a variation in the coefficient of restitution of the golf ball.

It is apparent that, within the scope of the invention, modifications and different arrangements may be made other than as herein disclosed, and the present disclosure is illustrative merely, the invention comprehending all variations thereof.

I claim:

1. A golf ball comprising a spherically-shaped solid core of resilient material, a first layer of hard, high flexural modulus ionomer resin molded onto the core, and a cover layer of soft, low flexural modulus ionomer resin molded over the first layer of ionomer resin on the core, the total weight of the golf ball not exceeding 1.620 ounces.

2. A golf ball comprising a spherically-shaped solid core of resilient polymeric material, a first layer of hard, high flexural modulus ionomer resin molded onto the core, and a second layer of soft, low flexural modulus ionomer resin molded over the first layer of ionomer resin on the core, the total weight of the golf ball not exceeding 1.620 ounces.

3. A golf ball comprising a spherically-shaped solid core of resilient polymeric material, a layer of comparatively hard, high flexural modulus ionomer resin molded onto the core, the exterior surface of the layer being of spherical configuration, and a cover layer of comparatively soft, low flexural modulus ionomer resin molded over the layer of hard, high flexural modulus ionomer resin, the outer surface of the cover layer being of dimpled configuration, the total weight of the golf ball not exceeding 1.620 ounces.

4. A golf ball comprising a spherically-shaped solid core of resilient material, a hard, high flexural modulus ionomer resin molded onto the core forming a layer on the core, a soft, low flexural modulus ionomer resin molded over the layer of high flexural modulus ionomer resin providing a cover layer of generally spherical shape, the exterior surface of said cover layer being of dimpled configuration, the total weight of the golf ball not exceeding 1.620 ounces, and the diameter of the golf ball being not less than 1.680 inches.

5. A golf ball according to claim 4 wherein the layer of hard, high flexural modulus ionomer resin is of a thickness in a range of 0.020 inches and 0.070 inches.

6. A golf ball according to claim 4 wherein the cover layer of soft, low flexural modulus ionomer resin is of a thickness in a range of 0.020 inches and 0.100 inches.

7. A three-piece golf ball comprising a spherically-shaped solid core of resilient material, a comparatively hard, high flexural modulus ionomer resin molded onto the core forming a layer of the hard, high flexural modulus ionomer resin on the core, and a comparatively soft, low flexural modulus ionomer resin molded onto the layer of hard, high flexural modulus ionomer resin forming a cover layer, the exterior surface of the cover layer being a dimpled configuration and generally of spherical shape, the total weight of the golf ball not

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exceeding 1.620 ounces, and the diameter of the golf ball being not less than 1.680 inches.

8. A three-piece golf ball comprising a spherically-shaped solid core of resilient material, a hard, high flexural modulus surlyn resin molded onto the core forming a first layer of spherical configuration on the core, a soft, low flexural modulus SURLYN resin molded over the first layer of hard, high flexural modulus SURLYN resin to form a cover layer of spherical configuration, the exterior surface of the cover layer being of dimpled configuration, and the total weight of the golf ball not exceeding 1.620 ounces.

9. A golf ball comprising a spherically-shaped solid core of resilient material, a first layer of hard, high flexural modulus ionomer resin molded onto the core, and a cover layer of soft, low flexural modulus foamable ionomer resin molded over the first layer of ionomer resin on the core, said cover layer being foamed to a cellular condition, the total weight of the ball not exceeding 1.620 ounces.

10. A golf ball comprising a spherically-shaped solid core of resilient material, a first layer of hard, high flexural modulus foamable ionomer resin molded onto the core, said first layer being foamed to a cellular condition, and a cover layer of soft, low flexural modulus ionomer resin molded over the first layer of foamable ionomer resin on the core, the total weight of the ball not exceeding 1.620 ounces.

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11. A golf ball comprising a spherically-molded solid core of resilient material, a first layer of hard, high flexural modulus foamable ionomer resin molded onto the core, said first layer being foamed to a cellular condition, and a cover layer of soft, low flexural modulus foamable ionomer resin molded over the first layer of ionomer resin, said cover layer being foamed to a cellular condition, the total weight of the ball not exceeding 1.620 ounces.

12. The method of producing a three-piece golf ball including providing a solid core of resilient material of spherical configuration, molding onto the core a hard, high flexural modulus ionomer resin providing a first layer on the core, molding a soft, low flexural modulus ionomer resin onto the first layer providing a cover layer of spherical shaped wherein the total weight of the golf ball does not exceed 1.620 ounces and the ball being of a diameter not less than 1.680 inches.

13. The method of producing a three-piece golf ball including providing a solid core of resilient polymeric material of spherical configuration, molding onto the core a hard, high flexural modulus SURLYN resin providing a first layer on the core, molding a soft, low flexural modulus Surlyn resin onto the first layer providing a cover layer of spherical shape wherein the total weight of the golf ball does not exceed 1.620 ounces and the ball being of a diameter not less than 1.680 inches.

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# EXHIBIT 3

**United States Patent** [19]  
**Molitor**

[11] **4,274,637**  
[45] **Jun. 23, 1981**

[54] **GOLF BALL HAVING CELLULAR COVER**

[75] Inventor: **Robert P. Molitor, South Hadley, Mass.**

[73] Assignee: **Questor Corporation**

[21] Appl. No.: **155,658**

[22] Filed: **Jun. 2, 1980**

**Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 7,964, Jan. 31, 1979, abandoned.

[51] Int. Cl.<sup>3</sup> ..... **A63B 37/12**

[52] U.S. Cl. ..... **273/235 R; 273/DIG. 8; 521/139; 521/143; 521/144; 521/149; 521/150; 521/155**

[58] **Field of Search** ..... **273/235 R, DIG. 8; 521/149, 143, 155**

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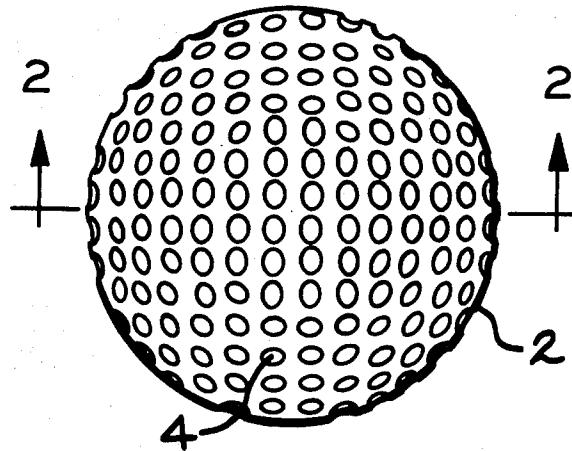
*Primary Examiner*—Morton Foelak  
*Attorney, Agent, or Firm*—Donald R. Bahr

[57]

**ABSTRACT**

The subject invention relates to a golf ball having a cover which is completely or partially formed from a cellular polymeric material. By incorporating the subject invention into a golf ball structure, it is possible to selectively alter its "feel" characteristics, the physical properties and flight characteristics. The subject invention can be utilized with golf balls having either solid or wound cores. The subject golf ball cover can be formed from a plurality of natural and synthetic polymeric materials. It is preferred that the golf ball cover be formed from ionic copolymers of polyolefins and unsaturated monocarboxylic acids wherein said ionomers incorporate zinc or sodium ions. Mixtures of said ionic copolymers may likewise be utilized.

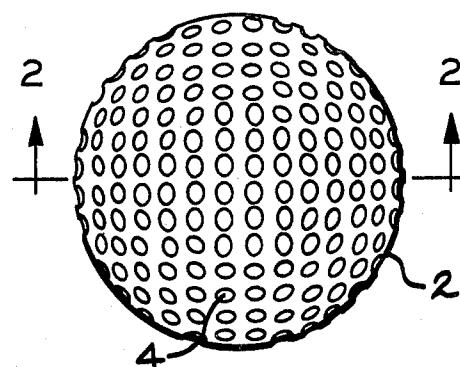
**24 Claims, 11 Drawing Figures**



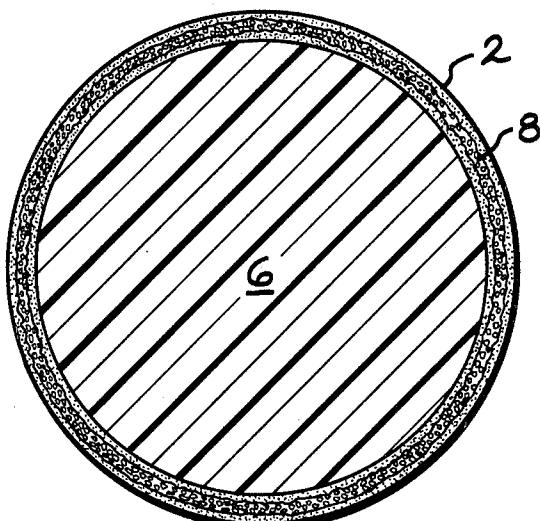
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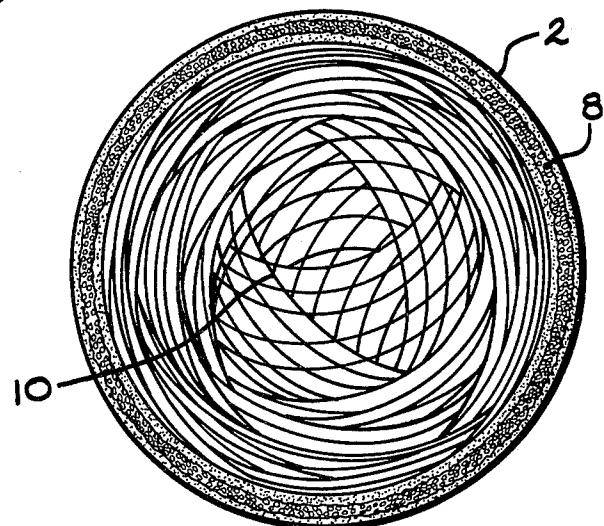


—FIG. 1



—FIG. 2

—FIG. 3



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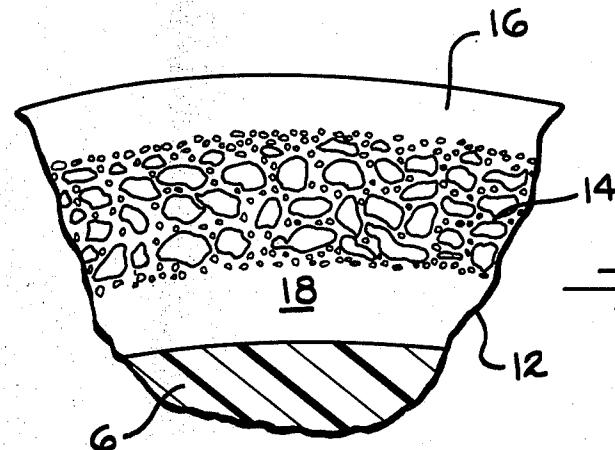


FIG. 4

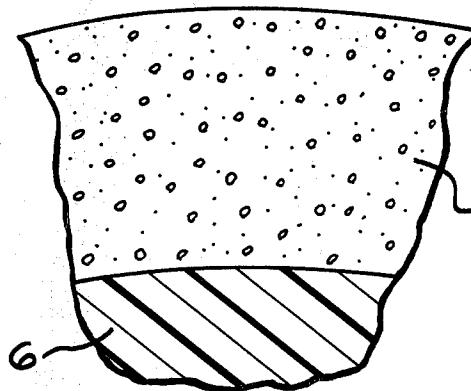


FIG. 5

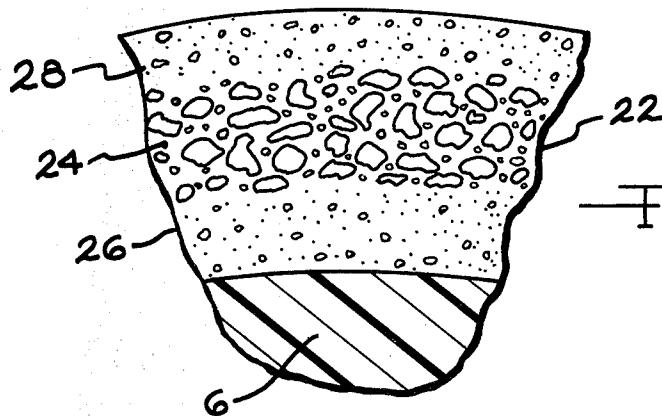
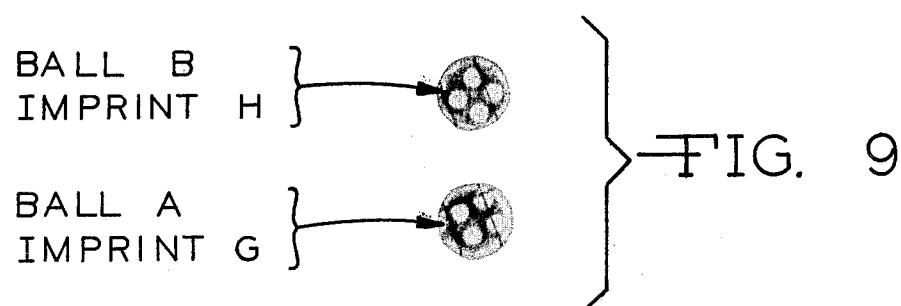
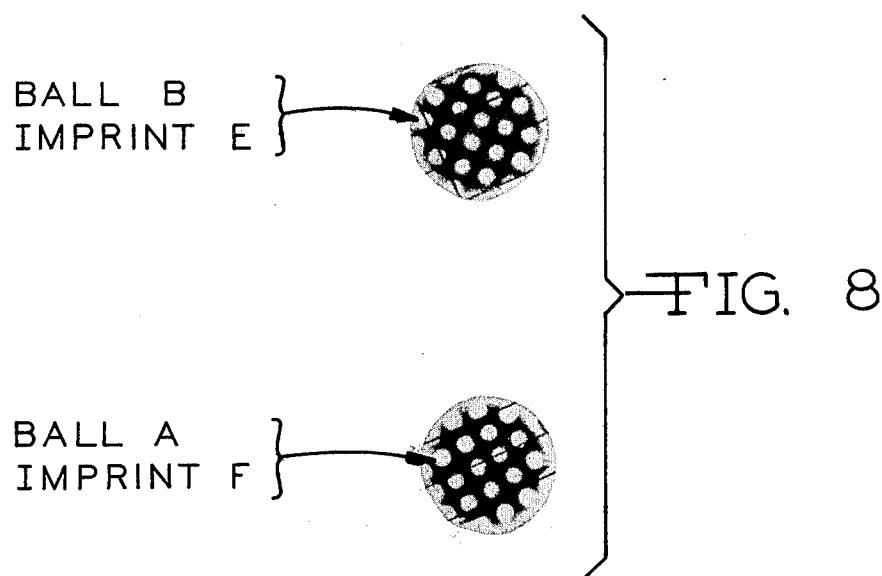
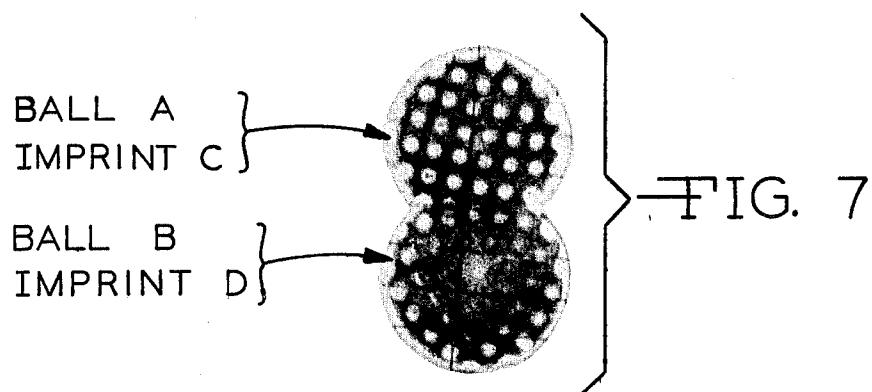


FIG. 6

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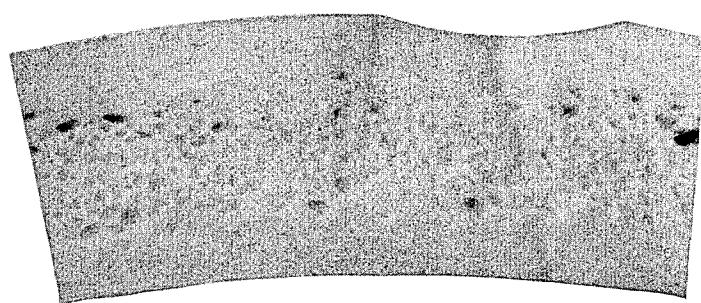
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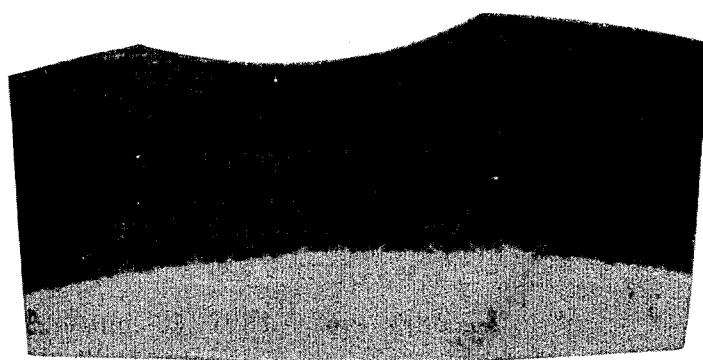
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—FIG. 10



—FIG. 11

**GOLF BALL HAVING CELLULAR COVER****RELATED APPLICATION**

This application is a Continuation-in-Part of application Ser. No. 7,964 filed Jan. 31, 1979, now abandoned.

**BACKGROUND OF THE INVENTION**

Golf balls have traditionally incorporated covers which are formed from polymeric materials. In this regard, the traditional golf ball having a cover formed from Balata rubber should be noted. The physical properties, and in particular, the "feel" of this Balata cover when struck with a golf club became the standard of the industry. In recent years golf balls have incorporated covers which are formed from synthetic polymeric materials such as polyolefins and in particular, polyethylene, polyurethanes and ionic copolymers of olefins. The latter mentioned ionic copolymers of olefins were commercially introduced in the mid 1960's by E. I. Du Pont De Nemours & Co., Inc., Wilmington, Del. and sold under the trademark "Surlyn." Cover compositions which are based on Surlyn resins have become extremely popular and are highly advantageous in that the resulting covers are extremely cut and abrasion resistant. Golf balls incorporating Surlyn resin covers are commonly known in golfing circles to be more cut resistant than Balata covered balls. These Surlyn covered golf balls have achieved widespread consumer acceptance. About sixty percent of the golf balls sold in the United States during 1976 incorporated Surlyn covers. Golf balls incorporating Surlyn covers are generally described in U.S. Pat. No. 3,454,280 issued July 8, 1969.

Most Surlyn resins as sold by E. I. De Pont De Nemours & Co., Inc., contain zinc or sodium ions. A plurality of Surlyn resins of varying physical properties are sold by E. I. De Pont De Nemours & Co., Inc. The physical properties of these various resins are described in technical bulletins which are readily available from E. I. De Pont De Nemours & Co., Inc. The principal Surlyn resins which are useful in this invention as golf ball cover materials are Surlyn 1605 and Surlyn 1557.

Mixtures of various Surlyn resins as cover stock materials are likewise highly advantageous. Suitable mixtures for use as cover stock materials are described in detail in U.S. Pat. No. 3,819,768 issued June 25, 1974.

Whether used singly or in mixtures, Surlyn resins, while being extremely advantageous due to their cut and abrasion resistance have one notable disadvantage as a golf ball cover stock material, namely that the feel of the ball when struck by a golf club is significantly different than that of a traditional Balata covered golf ball.

When a golf ball is struck by a golf club, an audible sound is emitted. This sound is generally referred to as the click of a golf ball. Again, the click of Surlyn covered golf balls is significantly different than the click of Balata covered golf balls. Some golfers and in particular, the purist who has traditionally used a Balata covered golf ball, find the change in click and the different feel of Surlyn covered golf balls to be objectionable.

For purposes of control some advanced golfers can strike a golf ball in such a manner that the flight of the ball incorporates substantial back spin. It is desirable that a golfer be able to impart back spin to a golf ball for purposes of controlling its flight and controlling the action of the ball upon termination of flight. For example,

if back spin is incorporated into the flight of a ball, the ball can be made to stop dead once it strikes the green instead of bounding forward. The ability to incorporate back spin onto a golf ball is related to the extent to which a golf ball deforms when it is struck with a golf club. Because traditional Balata covers are more deformable it is easier to impart spin to these traditional balls. In contrast, Surlyn covered golf balls due to the nature of the cover are not as deformable as Balata covered balls and hence it has been more difficult to impart a sufficient degree of back spin to these balls. This control advantage will be discussed in greater detail herein below.

A standard which is generally referred to as the coefficient of restitution is one of the criteria useful in judging the rebound characteristics of a golf ball. The nature of the cover stock has substantial bearing on the coefficient of restitution of any given golf ball. By use of the subject invention one skilled in the art can alter the coefficient of restitution of a given golf ball to a much greater degree than was possible utilizing the covers of the prior art. The ramifications of the coefficient of restitution in relation to the subject invention will be described in greater detail herein below.

Competitive advertising campaigns comparing Balata and Surlyn resin covered golf balls have extensively exploited the above enumerated disadvantages of Surlyn resin covered golf balls. In particular, these advertising campaigns have exploited the different feel, and the difficulty of imparting spin to Surlyn resin covered golf balls. One advertising campaign even went so far as to compare a Surlyn resin covered golf ball to a rock. By incorporation of the subject invention into the golf ball structure it is possible for the first time to achieve and selectively alter the cut resistance, the abrasion resistance, the coefficient of restitution, the feel, the click and the ability to impart back spin to a golf ball. Generally speaking, by use of this invention, these physical characteristics of a golf ball can be varied to an optimum degree by varying the apparent density and distribution of the cells in a golf ball cover. As a result of these variations, one skilled in the art can produce a golf ball having the desirable qualities of both Balata and Surlyn resin covered golf balls.

**DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a front view of a conventional golf ball;

FIG. 2 is a sectional view through line 2--2, of FIG. 1 showing the cover of this invention on a solid core golf ball;

FIG. 3 shows the cover of this invention on a wound core golf ball;

FIG. 4 is a sectional view showing one embodiment of the cover of this invention wherein said cover incorporates non-cellular skins;

FIG. 5 shows another embodiment of this invention wherein the composite cover is essentially cellular; and

FIG. 6 illustrates still another embodiment of this invention wherein the cover incorporates areas of varying cellular density.

FIG. 7 illustrates the superior high speed impact properties of the golf ball of the subject invention.

FIGS. 8 and 9 illustrate the superior low speed impact properties of the golf ball of this invention.

FIG. 10 is a photo micrograph showing a cross section of a representative golf ball cover in accordance

with this invention wherein said cover has well defined inner and outer skins.

FIG. 11 is a photo micrograph showing a cross section of a representative golf ball cover in accordance with this invention wherein said cover has no inner skin and a minimal outer skin.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

In its broad concept the subject invention relates to the use of cellular material as cover stock for conventional golf ball centers. As will be described in greater detail herein below, the cellular cover stock of this invention can have a uniform cellular cross section, a varying cellular cross section or be incorporated with one or more non-cellular skins. The cellular cover stock of the subject invention can be formed from any foamable, natural or synthetic polymeric material.

Such materials are known in the art and are generally prepared with blowing agents, nucleating agents, and other additives as necessary to create the desired structures.

Because they are cheaper and have superior processing characteristics, thermoplastic materials are generally preferred. However, thermosetting resins can likewise be used in accordance with this invention. Typical, but not limitative of the properties desirable for the resin are good flowability, moderate stiffness, high abrasion resistance, high tear strength, and good mold release among others. Preferred polymeric materials for use in accordance with this invention are ionomer resins comprising a copolymer of ethylene and an unsaturated monocarboxylic acid which is available under the trademark Surlyn from E. I. Du Pont De Nemours & Company of Wilmington, Del.

In accordance with the preferred embodiment of this invention, the cellular cover in question is formed from either a zinc or sodium ionic copolymer of ethylene or mixtures thereof. The sodium copolymer being sold by the E. I. De Pont De Nemours & Co., Inc., under the trademark Surlyn 1605, the zinc copolymer being sold under the trademark Surlyn 1557.

The use of singular ionic copolymers of polyethylene materials as golf ball cover stock is described in U.S. Pat. No. 3,454,280 issued July 8, 1969. The use of mixed Surlyn resins in accordance with this preferred embodiment is described in great detail in U.S. Pat. No. 3,819,768 issued June 25, 1974. Ionic copolymers of the type suitable for use in this invention are further described in great detail in U.S. Pat. No. 3,264,272 issued Aug. 2, 1966.

Referring to the drawings, it can be seen that FIG. 1 illustrates a standard golf ball structure 2 which incorporates a plurality of conventional dimples 4. Dimples 4 are molded into the cover material which is the subject matter of this invention. In this patent application when referred to generally golf ball 2 is meant to include golf balls having solid or wound centers.

Referring to FIG. 2 of the drawings, it can be seen that golf ball 2 incorporates a solid center 6 which is in turn encapsulated by a cellular cover 8. Center 6 generally comprises a highly cross linked polybutadiene sphere. The technology for producing solid centers such as center 6 is generally known in the prior art and does not constitute part of the subject invention.

Referring to FIG. 3 it can be seen that in this instance golf ball 2 incorporates a wound center 10 which is in turn encapsulated by a cellular cover 8. Wound center

10 generally comprises the central sphere not shown over which is wound an extended length of an elastomeric thread in order to produce a sphere of a given size. Technology for the production of spheres of the type illustrated by wound center 10 is well known in the prior art and does not constitute part of this invention.

FIGS. 4, 5 and 6 represent three distinct embodiments of the subject invention. While these three distinct embodiments are illustrated on a solid center which has been given a common designation 6, it is understood that the embodiments as illustrated in FIGS. 4, 5 and 6 can likewise be incorporated on wound centers such as center 10 of FIG. 3.

FIG. 4 represents a preferred embodiment of this invention for use in conjunction with a solid center. In this embodiment cover 12 incorporates a central cellular stratum 14 which is sandwiched between two non-cellular skins 16 and 18. Non-cellular skins 16 and 18 are formed in situ by varying the process parameters wherein cover 12 is molded onto center 6.

Skins 16 and 18 can be altered and formed by a plurality of techniques, for example, skins 16 and 18 can be formed by varying the temperature of the mold during the initial stages of the injection molding process and by varying other parameters, such as melt temperatures, injection time, injection speed, injection pressure, nozzle type, gating, venting, holding pressure, holding time, shot weight, blowing agent concentration, nucleator concentration, polymeric composition, mold surface treatment and mold lubricant.

FIG. 5 illustrates another embodiment of this invention wherein cover 20 incorporates an essentially uniform cellular structure. In this embodiment cover 20 is again molded over center 6.

FIG. 6 represents still another embodiment of this invention wherein cover 22 is molded over center 6. Cover 22 incorporates a central stratum 24 which is sandwiched between a pair of strata 26 and 28. The central stratum 24 has an apparent density which is less than that of strata 26 and 28. To put it in other words, strata 26 and 28 have a greater apparent density than that of central stratum 24. Naturally, it is obvious to one skilled in the art that in the region of the interfaces between stratum 24, 26 and 28, the apparent density of cover 22 will vary. The respective apparent densities of strata 24, 26 and 28 can be varied by one skilled in the art by altering the process parameters as discussed above wherein cover 22 is molded onto center 6.

For purposes of this application, when densities and specific gravities are referred to, they are referred to in "apparent densities" and "apparent specific gravities." These terms take into consideration the fact that the cover stocks of this invention are non-uniform in that they may incorporate skins and variable cell structures. These terms take into consideration these variables and give the actual density and specific gravity of the average structure.

The solid centers for use in accordance with this invention are approximately 1.50" diameter. In accordance with contemporary thinking, all golf balls are 1.680"-1.690" in diameter. Therefore, it can be seen that the cover thickness of the ball of this invention is approximately one-half the difference between the center size and the finished ball size, or approximately 0.090".

I have found that cover thicknesses of this size are generally advantageous and functional when used with this invention. Naturally, it would be possible to utilize larger diameter centers and hence minimize the cover

thickness. Generally, it could be said that the cover thickness should not decrease to a point beyond which functional foaming is impossible. While full parameters of the cover thickness have not been explored, it generally appears as though functional foaming cannot be achieved, when the cover is injection molded onto the center, if the cover thickness decreases below 0.060".

It is within the realm of this invention to utilize covers thicker than the above mentioned standard of approximately 0.090". Thicker covers in accordance with 10 this embodiment can be from about 0.090" to about 0.125". Naturally, when thicker covers are utilized, the center diameter is reduced accordingly.

It is understood by those skilled in the art that the 15 diameter of wound centers is normally greater than that of a solid center. During the process whereby the cover is placed over the center, the wound center is compressed with the net result that the effective size in the finished center is similar to the 1.50" dimension discussed above relative to a solid center.

In addition to the above described preferred Surlyn 20 resins, natural polymeric materials may be used in accordance with this invention.

Balata or gutta percha is an example of natural polymeric material adapted for use in accordance with this 25 invention.

The range of synthetic polymeric materials which can be used in accordance with this invention, other than the above described Surlyn resins, is much broader than the range of natural materials. Suitable polymer 30 materials which may be adapted for use in this invention are as follows:

Homopolymeric and copolymeric substances, such as (1) vinyl resins formed by the polymerization of vinyl chloride or by the copolymerization of vinyl chloride 35 with unsaturated polymerizable compounds, e.g., vinyl esters; (2) polyolefins such as polyethylene, polypropylene, polybutylene, transpolyisoprene, and the like, including copolymers of polyolefins; (3) polyurethanes such as are prepared from polyols and organic polyisocyanates; (4) polyamides such as polyhexamethylene; (5) polystyrene, high impact polystyrene, styrene acrylonitrile copolymer and ABS, which is acrylonitrile, butadiene styrene copolymer; (6) acrylic resins as exemplified by the copolymers of methylmethacrylate, acrylonitrile, and styrene, etc.; (7) thermoplastic rubbers such as the urethanes, copolymers of ethylene and propylene, and transpolyisoprene, block copolymers of styrene and cispolybutadiene, etc.; and (8) polyphenylene oxide resins, or a blend with high impact polystyrene known by the trade name "Noryl." This list is not meant to be limiting or exhaustive, but merely illustrates the wide range of polymeric materials which may be employed in the present invention. Mixtures of the above described material may also be used.

It is within the purview of this invention to add to the cover compositions of this invention compatible materials which do not affect the basic novel characteristics of the composition of this invention. Among such materials are coloring agents, including dyes and pigments, 60 fillers and similar additives. Additives such as antioxidants, antistatic agents, and stabilizers may also be added. The upper limit of the quantity of additives is usually about 5 percent by weight of the product.

The golf ball cover material of this invention can be 65 applied to a center in any standard manner. For example, the cover material can be injection molded directly around a pre-positioned center. Likewise two half shells

of a cover can be formed from the cover material of this invention, these half shells are then positioned around a center and fused together in such a manner as to form a finished golf ball. Again the forming technique whereby the finished golf ball is produced is not an integral part of this invention. However, the cover composition of the subject invention can utilize many standard manufacturing techniques to form finished golf balls. Naturally the technique utilized must provide physical conditions sufficient to make foaming possible.

As was briefly discussed above the cover material of this invention is applied over a standard center in a conventional fashion. Centers of either the solid or wound type can be used in accordance with this invention. With reference to the wound type center a threadlike material is wound either over a solid core or a spherical shell which is liquid filled. The threadlike material which is wound around this small core is either in a thread or tape form. With reference to the solid center balls, these are balls wherein the center generally comprises a sphere which is formed from a resilient polymeric material. Because the center material is not an integral part of this invention it is not thought that a detailed discussion of center materials is necessary. However, it can be said that the cover material of the subject invention can be utilized in conjunction with any standard golf ball center.

As was mentioned above, the golf ball cover of the subject invention can be used as a means of altering or regulating the coefficient of restitution. The coefficient of restitution of a golf ball is generally indicative of the resiliency of the ball in question, hence indicative of the distance the ball will travel when struck with a golf club. Both the center and the cover contribute to the coefficient of restitution; however, for purposes of this invention we are concerned solely with the coefficient of restitution as it is affected by the cover material. The coefficient of restitution is generally measured by propelling a finished golf ball against a hard surface at a fixed velocity. After the ball has rebounded from the surface its velocity is again measured. The ratio of the rebound velocity over the initial velocity is the coefficient of restitution. The coefficient of restitution is directly related to the resiliency of a golf ball and how far it will travel when struck by a golf club, all other variables being constant.

The resiliency of a golf ball is regulated by the United States Golf Association via a test which is generally referred to as the Initial Velocity test. In this test, a golf ball is struck by a rotating club face. The rotating club face is turning at a speed of approximately 146 ft. per second. Once struck by this club face, the velocity of the ball is measured as it passes through two light screens which are positioned forward of said club face. The maximum prescribed limit for a golf ball which is tested in this manner is 225 ft. per second at 75° F. This upper limit standard of 255 f.p.s. corresponds to a coefficient of restitution of approximately 0.795.

With reference to the above described standards for coefficient of restitution, the subject cover material is particularly advantageous in that in using this invention golf balls with solid centers can be produced which closely approach the 0.795 maximum limit. In accordance with one embodiment of this invention this end is achieved by forming a center which exceeds the 0.795 limit and thereafter placing a cover on said center to decrease the coefficient of restitution to 0.795.

The ability and the degree which the coefficient of restitution can be altered is illustrated in examples below. From the data of these examples it can be seen that the coefficient of restitution of a given golf ball is altered by changing the cover stock material from a solid material to a cellular material. While it is certainly desirable to approach without exceeding the above mentioned maximum coefficient of restitution, what is desirable other than approaching this prescribed maximum limit is a matter of conjecture. The data in question amply demonstrate that by utilization of the subject invention, changes in the coefficient of restitution of a given golf ball are possible. By utilization of the subject invention design latitude in a given golf ball system is possible where in the prior art no such design latitude existed.

The cellular covers of the subject invention are formed by the in situ blowing of the polymeric material during the process whereby the cover is molded on to the core. A wide range of blowing agents may be utilized to effect the foaming of the polymeric material. Examples of suitable organic blowing agents are as follows: azobisisformamide; azobisisobutyronitrile; diazoaminobenzene; N, N-dimethyl-N, N-dinitroso terephthalamide; N, N-dinitrosopentamethylene-tetramine; benzenesulfonyl-hydrazide; benzene-1, 3-disulfonyl hydrazide; diphenylsulfon-3-3, disulfonyl hydrazide; 4, 4'-oxybis benzene sulfonyl hydrazide; p-toluene sulfonyl semicarbazide; barium azodicarboxylate; butylamine nitrile; nitroureas; trihydrazino triazine; phenylmethyl-urathan p-sulfonhydrazide; and inorganic blowing agents such as ammonium bicarbonate and sodium bicarbonate.

These blowing agents generally function by their thermal decomposition which creates an in situ gas that is absorbed by the melt. When pressure is released the melt expands to form the foam. In addition to this procedure, it is commercial practice to inject a gas into the melt under pressure such as nitrogen, air, trichloromonomofluoromethane, pentane, carbon dioxide, etc. The gas is then absorbed and, again upon release of pressure, the melt expands into a foam.

The preferred embodiment of this invention utilizes a nitrogen generating blowing agent which is susceptible to thermal decomposition.

Naturally, the percentage of blowing agent utilized in accordance with this invention will vary with the physical and chemical properties of the blowing agent so utilized and the desired apparent density of the resulting golf ball cover. In accordance with the preferred embodiment of this invention, from 0.1 to 0.5 percent of Ficel EPA is utilized based on the weight of the thermoplastic resin. Ficel EPA is a trademark used in conjunction with a blowing agent which is essentially azodicarbonamide. Ficel EPA is available from Sabin Chemicals, Inc., Sabin Park, Boston, Mass. 02201.

The apparent density of the cellular golf ball cover in accordance with this invention can also be varied by the injection techniques. The injection techniques in question are well understood by one skilled in the art and include such variables as the ram forward time, injection speed, shot size, gate size, mold venting, injection pressure, holding pressure, etc.

It is also well known, that, depending upon the nature of the blowing agent utilized, one can produce a unicellular foam structure or an interconnecting cell structure for the golf ball covers of this invention. In accordance

with the preferred aspect of this invention the golf ball cover incorporates a unicellular foam structure.

As mentioned above, the golf ball cover of the subject invention can be applied to a suitable center by a plurality of means. In accordance with the preferred aspects of this invention the golf ball cover is applied to the core by injection molding. In the preferred injection molding technique a master batch of formulated plastic molding powder is prepared. This master batch is dry blended and includes one or more polymer materials, coloring agents, antioxidants, blowing agents, etc. Naturally, the blowing agent is blended into the polymeric material at a temperature below the decomposition temperature of said blowing agent. This master batch may then be pelletized. A golf ball center is then positioned in a mold. The above mentioned master batch pellets are then fed into the injection molding machine and the resulting melt is injected into the mold in such a manner that the polymer material foams and flows around and adheres to the core. During this molding process the dimples are formed on the cover. The resulting golf ball is then allowed to cool whereupon an essentially finished golf ball is removed.

Another significant aspect of the subject invention is that by the use of a cellular cover stock material the net cost of the golf ball cover is decreased. High quality polymeric materials which are suitable for use as golf ball cover stock material are relatively expensive. For example, the cost of the above described Surlyn resins including in-house processing, before injection molding onto a golf ball center, is at least eighty cents (\$.80) per pound. By means of this invention the utilization of the golf ball cover stock material is maximized; that is, more golf ball covers are produced per pound of material. To put the cost aspects of the subject invention in their proper perspective, one can say that it is cheaper to make a golf ball cover out of a cellular polymeric material wherein the cells contain a blowing gas than to make said cover out of the non-cellular polymeric material. Considering the cost of the polymeric materials involved it is evident that this cost saving feature is a significant advantage.

The resulting composite golf ball cover of the subject invention is likewise advantageous in that the apparent specific gravity of the cover stock is less than the specific gravity of the balls which are covered with non-cellular materials. The apparent specific gravity of the composite cover stock including the non-cellular skins as described above can be from about 0.65 to about 1.50 in accordance with the broad embodiment of this invention. A preferred range for this apparent specific gravity is from about 0.65 to about 1.25 with the most preferred apparent specific gravity being from about 0.75 to about 0.80. In order to make an objective comparison, these specific gravities must be compared to the specific gravities of the non-cellular materials. These specific gravity variations can be achieved by varying the cellular structure of the subject golf ball cover. As a point of reference, it should be noted that the Surlyn resins as used on the prior art golf balls have a specific gravity of 0.940 to 0.965.

The physical properties and flight characteristics of a golf ball are affected to some degree by the weight distribution in the resulting finished golf ball. In some instances it is desirable to concentrate the weight as near as possible to the center of gravity of the ball. Considering this fact, advantages in ball design are automatically produced by the subject invention in that a

greater percentage of the overall weight is concentrated in the center of the ball as compared to a conventional ball with a noncellular cover. It can further be seen that for the first time one skilled in the art of golf ball manufacture can alter dynamics and flight characteristic of a resulting golf ball by varying the density of the cover stock material. Because of this weight distribution it is possible to impart greater spin to a golf ball when struck by a club as there is less rotational inertia to overcome. Before this invention this mode of design latitude was not possible.

In addition to the advantage as discussed above which results from weight distribution, this invention is very advantageous because the resulting golf ball has different high speed and low speed impact properties, when compared to a similar ball with a non-cellular cover.

At high speed impact the cover deforms to such a degree that the club face comes into substantially more contact area with the cover as compared to a ball having a non-cellular cover. As a result, greater control can be imparted to the ball to allow purposeful manipulation of the ball in play, for example, back spin, drawing, fading. The energy required for high speed deformation of the cover is less than necessary with conventional covers. This allows more energy at impact to be imparted directly into the inner core material where it can enhance the flight of the golf ball.

In contrast, this same cellular covered ball has different low speed impact properties, which are useful in putting. At low speed impact the cellular covered ball requires a greater impact force than a conventional ball for the same distance of travel since the cellular cover at low speed impacts creates a deadening effect which is similar to Balata covered balls. It is well known that in putting, margins of error can be greatly reduced when more force is required to move a ball a certain distance on the putting green.

An example of these control properties at low speed impacts is as follows: If a ball, such as a ball with a conventional non-cellular Surlyn cover, bounces off the face of the putter, the margin of error can be very great. In contrast, if more energy is needed to impart movement of the ball, errors will be minimized in their effect on ball movement.

Another significant advantage of these low speed impact properties in putting is that as a result of the energy absorption as described above, the golf ball coming off the putter face established a true roll sooner than a ball with a non-cellular cover. Prior art balls with non-cellular covers tend to skid on the green before starting a true roll because the covers are not as capable of absorbing energy in a low speed impact sequence.

It is to be noted that in accordance with this invention, all of the above discussed critical physical properties can be varied by controlling the variation in the cell size, cell size distribution cover thickness and apparent density of the cellular cover material. Because of the above described interaction of the ball of this invention with the club face, superior control and feel can be realized. As a result of this control and feel a skilled player can create at will draws, fades, and on approach to the green, make the ball bite and hold in a superior manner due to the greater back spin.

The ability to control the golf ball of this invention when struck by a golf club as a result of its desirable high speed and low speed impact properties is illustrated in FIGS. 7, 8 and 9. In the test as illustrated by

FIGS. 7 and 8, the impacts were made by feeding specimen balls into a golf ball firing machine, wherein the ball is driven against a steel plate at 125 ft. per second. For making the imprints in question, the face of the steel plate is covered with a carbon type transfer paper. The high speed impact test used to make the imprints of FIGS. 7 and 8 were identical. In FIG. 7 an imprint was made by ball A. Ball A is a Surlyn covered golf ball having Center A as described herein below and the cover of a golf ball manufactured by the applicant and sold under the trademark TOP-FLITE. The cover of this ball is made in accordance with the teachings of U.S. Pat. No. 3,819,768 issued June 25, 1974. The imprint made by ball B of FIG. 7 was made by a ball which was nearly identical in all respects to the ball used to make imprint C except that the cover stock was cellular using 0.3 percent of Ficel EPA blowing agent. The resulting golf ball was similar to the ball described in Example 1 and illustrated in FIGS. 2 and 4. It can be readily seen that imprint D is larger than imprint C. The average diameter of imprint C was 1.020 inches while the average diameter of imprint D was 1.068 inches. In accordance with the theories discussed above the surface distortion of ball B with the steel plate was significantly greater than the surface distortion of ball A. In addition to the greater surface distortion of ball B over ball A it can be seen that ball B further wets out to a greater degree as the dimple pattern imprint of ball B is not as sharp as the dimple pattern imprint of ball A. Accordingly, greater control could be imparted to the ball.

In FIG. 8, balls "A" and "B" as described above in connection with FIG. 7 were fired in accordance with the test procedure of FIG. 7 at 80 feet per second. Ball "B" formed imprint "E" which had a diameter of 0.789". Ball "A" formed imprint "F" which had a diameter of 0.750". As can be seen from the difference in the diameters of these imprints, ball "B" deformed significantly more than ball "A" during this test procedure.

FIG. 9 is concerned with the low speed impact properties of a golf ball of this invention. In the test as illustrated in this figure, balls "A" and "B" as described above in connection with FIG. 7 were utilized. These balls were dropped from 100" onto a steel plate. Ball "A" formed imprint "G" which had a diameter of 0.416". Ball "B" formed imprint "H" which had a diameter of 0.422". Again from the differences in these diameters, it can be seen that ball "B" as per imprint "H" tended to wet out significantly more than ball "A" as per imprint "G". In addition to imprints "G" and "H" relative to this test, it should be noted that in this test ball "A" rebounded to a height of 76" and ball "B" rebounded to a height of 73". This difference in rebound further points out that the ball of this invention would have a softer feel on the face of the golf club. It is felt that this test would be analogous to a putting shot on a golf course.

Relative to the test of FIGS. 7, 8 and 9, it should be noted that in order to achieve maximum uniformity, these tests were conducted on balls having identical centers. In actuality, this is not possible or practical in the formation of commercially saleable balls because the cover of ball "B" is significantly lighter than the cover of ball "A". Due to this difference in weight in a practical situation the weight of the center of ball "B" should have been adjusted upwardly in order to compensate for this difference in cover weight. If this adjustment was in fact made, it is felt that the differences

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in the respective imprints of balls "A" and "B" in FIGS. 7, 8 and 9 would have been greater than those enumerated above because ball "B" would have had greater mass and, hence, greater kinetic energy upon impact.

Table I below represents data from driving tests as were carried out on the ball of this invention in comparison with standard commercially available balls. In the driving test, ball "C" was a standard commercially available two piece ball as sold by the applicant under the trademark "TOP-FLITE." Ball "B" was a ball made in accordance with this invention and generally in accordance with Example I herein below. Ball "C" had a coefficient of restitution of 795. Ball "B" had a coefficient of restitution of 782.

Relative to the data of Table I, it is particularly noteworthy that ball "B", the ball of this invention, had a carry advantage over ball "C" at 145 feet per second. At 160 feet per second ball "C" had a slight carry advantage over ball "B". The carry advantage of ball "B" at 145 feet per second is thought to be particularly significant considering the additional above enumerated advantageous properties of the ball of this invention as are reflected in ball "B".

Relative to the data of Table I, it should be noted that the club speed of 145 feet per second is high considering the ability of an ordinary golfer to strike a golf ball. It is felt that a club speed of 145 feet per second would represent the upper spectrum of golfers, such as a 4 or 5 handicap golfer. The test at 160 feet per second, while interesting from a comparative point of view, is not felt to be meaningful relative to the abilities of the average golfer as very few golfers are able to achieve a club speed of 160 feet per second.

It is particularly noteworthy that ball "B" went almost as far as ball "C" considering that the coefficient of ball "B" was significantly less than that of ball "C". It is felt that this fact demonstrates a particularly advantageous property of the ball of this invention in that apparently more energy from the golf club head is being transferred through to the core and less energy is being absorbed by the cover. This advantage would allow one to stay well under the prescribed coefficient of restitution of 0.795 as correlates with the initial velocity as specified by the USGA and yet manufacture balls which will travel further. In regard to the total distance to which a ball can travel, it should be noted that the USGA recently added a specification in this regard. The specification in this regard states that a machine driven ball will not travel more than 280 yards plus 8 percent when hit in accordance with specified conditions. It is not felt that this test is limiting relative to the balls of this invention as the specified yardage of 280 yards is beyond the capabilities which an average human can drive a golf ball. This test is mentioned in order that the above discussed data can be evaluated in its proper perspective.

#### Driving Procedure

Combined distance of a driver and a #5 iron test procedure was as follows: 6 of each of balls "B" and "C" were fired 3 times using a #1 wood (driver) at 145 feet per second club head speed. Each ball was fired 3 times using a #5 iron at 145 feet per second. The entire test procedure was repeated at 160 feet per second. The driving was effected using a True Temper Driving Machine, Ser. No. 7 as purchased from the True Temper Corporation, 1623 Euclid Avenue, Cleveland, Ohio.

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The tests were conducted at 68°-70° F. at a wind speed of 0-2 m.p.h. All distances are in yards.

TABLE I

			Ball "B"	Ball "C"
5	Driver - 145 fps	Carry	197	194
		Total Distance	211	210
	#5 Iron - 145 fps	Carry	168	162
		Total Distance	179	182
10	Combined Distance			
	Driver & #5 Iron	Carry	365	356
	145 fps	Total Distance	390	392
	Driver - 160 fps	Carry	215	214
		Total Distance	232	231
	#5 Iron - 160 fps	Carry	176	179
		Total Distance	182	184
15	Combined Distance			
	Driver & #5 Iron	Carry	391	393
	160 fps	Total Distance	414	415

The term "consisting of" as used in the definition of the ingredients present in the claimed golf ball and in the below listed examples is intended to exclude the presence of other materials in such amounts as to interfere substantially with the properties and characteristics possessed by the composition set forth but to permit the presence of other materials in such amounts as not substantially to affect said properties and characteristics adversely.

In this application the term "wets out" is utilized in describing the deformation of golf balls when they come in contact with golf clubs. The term is meant to define the degree to which the spherical golf ball surface deforms to mate up with the planar non-deformable golf club face.

The following examples will illustrate the subject invention. These examples are given for the purpose of illustration and not for purposes of limiting this invention.

#### EXAMPLES

40 In the below listed examples, unless specified otherwise, when the golf ball is referred to as having a solid center, the centers all had a diameter of approximately 1.50". Three different centers were utilized. Center A had a coefficient of restitution of  $0.780 \pm 0.010$  and a compression of  $85 \pm 10$  PGA. Center B had a coefficient of restitution of  $0.765 \pm 0.010$  and a compression of  $60 \pm 10$  PGA. Center C had a coefficient of restitution of  $0.790 \pm 0.010$  and a compression of  $100 \pm 10$  PGA.

50 The centers in question consist essentially of highly cross linked polybutadiene rubber wherein the principle cross linking agents are peroxides and heavy metal organic salts.

55 In the examples, when a wound Center D is utilized, said center has a diameter of  $1.560 \pm 0.010$ ", a compression of  $90 \pm 10$  PGA, and a coefficient of restitution of  $0.825 \pm 0.015$ . Wherein said wound center is manufactured by winding in a conventional manner onto a highly resilient polybutadiene solid center having a diameter of 1.125" rubber thread having a high content of polyisoprene, to the above described compression and size dimensions.

60 In all the below listed examples except Examples 18 and 19, the covers were applied to the respective centers by injection molding techniques wherein the center is pre-positioned in a mold and the cover stock material injected into said mold in such a manner that it flows around the pre-positioned center. The center and the mold temperature were approximately 70° F.

Wherein the cycle time of said injection molding process is such that the material is given ample time to freeze around the pre-positioned center. Generally, these cycle times are on the order of 30 to 50 seconds depending on mold cooling rates. Naturally, it is understood by one skilled in the art, that the cycle time varies with the nature of the polymer material being used as cellular cover stock material and in particular its melt temperature.

Wherein compression is specified, for balls and ball components this compression was measured on a Riehle Model #501A-17 machine and measuring its deformation under a fixed load at a fixed stroke. This unit is used rather than the conventional PGA unit because of greater accuracy. Throughout these tests, the fixed load was 200 lbs. The data received from said test were then converted into PGA compressions by the use of the simple formula: 160 minus the Riehle reading equals the PGA reading. PGA compressions are specified as they are a standard widely used by industry. In this test one reading was taken on each of twelve amplexes and the average of said test specified as the compression.

Wherein barrel test durability data is specified, the 12 balls were fired from a pneumatic cannon for 100 blows at 135 f.p.s. at room temperature into a seven-sided steel container, 15 inches across first striking a metal plate with corrugations simulating the corrugations on an iron head, then rebounding off of the remaining sides.

Wherein the golf balls were checked for cold cracking durability, 12 balls were fired five times out of the pneumatic cannon of the coefficient of restitution machine as described below. The muzzle velocity of the balls in question was 165 feet per second. The balls were fired against a steel plate which was positioned at right angles to the axis of ball flight. The steel plate was positioned 10 feet from the muzzle of said cannon. Prior to firing, the balls were conditioned at 0 degrees Fahrenheit for 16 hours.

Where guillotine test data are specified, said tests were conducted by placing the ball into a retaining cup holding the lower third of the ball in a fixed position, a free falling weight of 1360 grams having a blunt edged blade similar to the leading edge of an iron club was allowed to fall from a height of 36 inches.

The coefficient of restitution data as specified below was arrived at by firing 12 balls from a pneumatic cannon at muzzle velocity of 125 f.p.s. against a steel plate which is positioned 10 feet from the muzzle of said cannon, and measuring both the initial velocity and return velocity of said rebounding ball. The ratio of said return velocity to said initial velocity is the specified coefficient of restitution. The results are reported as the average of the balls so tested.

Wherein low speed rebound data is specified, this data was arrived at by dropping 12 balls in question from a height of 100" onto a steel plate and measuring the rebound height of the dropped golf ball. The average test results are reported.

In the data all parts are given by weight unless otherwise specified. In preparation of the golf balls in question the specified polymeric cover material was dry blended with the specified blowing agent and fed into the extruder section of the injection molding process in a conventional manner.

In the specified data, wherein test results of a single ball is referred to, these data represent data for a plurality of balls as tested in accordance with the respective test procedures.

The test results of the balls in question are to be compared with a standard Surlyn covered golf ball having a solid center as sold by the applicant under the Trademark TOP-FLITE.

Wherein the ball in question has a PGA compression of 100, a coefficient of restitution of 0.90, a low speed rebound of 74 inches. Wherein 12 out of 12 balls passed the cold cracking and durability test, 12 out of 12 balls passed the guillotine test and 12 out of 12 balls passed the barrel test.

These test results are further to be compared with a standard Balata covered ball having a wound center as sold by the Acushnet Company, New Bedford, Mass. under the trademark Titleist Pro Trajectory. Wherein said balls have a compression of 96, a driving range of 223 yards, a coefficient of restitution of 0.780, and a low speed rebound of 68 inches. Wherein 12 out of 12 balls failed the barrel test. Twelve out of 12 balls passed the cold cracking durability test and 12 out of 12 balls failed the guillotine test.

In the example below, a plurality of components are referred to by the trademarks under which they are sold. The products in question in accordance with the best information available to the applicant are as follows: In the cover stock formulation listed in the examples the Titanium Dioxide, unless otherwise specified, was added via a Masterbatch "A" which had the following composition:

4 parts Surlyn 1557 to 1 part Unitane 0-110. Unless otherwise specified, the blowing agent was added via Masterbatch "B" which is sold under the trademark Nortech MF 1039 H.

Product	Trademark	Chemical Description	Manufacturer
Surlyn 1557		Zinc ionic polyethylene	E. I. Du Pont De Nemours & Co., Inc., Wilmington Delaware
Suryln 1605		Sodium ionic polyethylene	E. I. Du Pont De Nemours & Co., Inc., Wilmington, Delaware
Unitane		Titanium dioxide	Am. Cyanamid Stamford, CT
Ficel EPA		Modified 1-1 Azobisformamide (Azodicarbonamide)	Haake Inc. Saddlebrook, NJ
Nortech MF 1039 H		4 parts polyolefin 1 part 1-1 azobis-formamide (Azodicarbonamide)	Northern Petrochemical Company Clinton, MA

#### EXAMPLE 1

In this example, center A was utilized. A cover stock was formed by dry blending the components of Table 2 below.

TABLE 2

	Parts
Surlyn 1605	88.00
Surlyn 1557	17.40
TiO <sub>2</sub> Master Batch A	35.20
Blowing agent Master Batch B	2.32

The compression of the resulting golf ball was 95. A barrel test resulted in 12 out of 12 balls passing. The cold cracking test resulted in 6 out of 6 balls passing.

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The guillotine test resulted in 12 out of 12 balls passing. The coefficient of restitution of the ball was 0.780. In the low speed rebound test, the ball bounced 72 inches.

#### EXAMPLE 2

In this example, center B was utilized. A cover stock was formed in accordance with Table 3 below.

TABLE 3

	Parts
Surlyn 1605	88.00
Surlyn 1557	17.40
TiO <sub>2</sub> Master Batch A	35.20
Blowing agent Master Batch B	2.32

The compression of the resulting golf ball was 90. A barrel test resulted in 12 out of 12 balls passing. The cold cracking test resulted in 6 out of 6 balls passing. The guillotine test resulted in 12 out of 12 balls passing. The coefficient of restitution of the ball was 0.780. In the low speed rebound test, the ball bounced 72 inches.

#### EXAMPLE 3

In this example, center C was utilized. A cover stock was formed in accordance with Table 4 below.

TABLE 4

	Parts
Surlyn 1605	88.00
Surlyn 1557	17.40
TiO <sub>2</sub> Master Batch A	35.20
Blowing agent Master Batch B	2.32

The compression of the resulting golf ball was 110. A barrel test resulted in 12 out of 12 balls passing. The cold cracking test resulted in 6 out of 6 balls passing. The guillotine test resulted in 12 out of 12 balls passing. The coefficient of restitution of the ball was 0.785. In the low speed rebound test, the ball bounced 70 inches.

#### EXAMPLE 4

In this example, center D was utilized. A cover stock was formed in accordance with Table 5 below.

TABLE 5

	Parts
Surlyn 1605	88.00
Surlyn 1557	17.40
TiO <sub>2</sub> Master Batch A	35.20
Blowing agent Master Batch B	2.32

The compression of the resulting golf ball was 95. A barrel test resulted in 12 out of 12 balls passing. The cold cracking test resulted in 6 out of 6 balls passing. The guillotine test resulted in 12 out of 12 balls passing. The coefficient of restitution of the ball was 0.770. In the low speed rebound test the ball bounced 73 inches.

#### EXAMPLE 5

Example 4 was repeated except that a center having the following physical properties was utilized. The center had a diameter of 1.550 inches, a coefficient of restitution of 0.808, a weight of 37.0 grams and a PGA compression of 75. A cover stock was formed in accordance with Example 4. Because the center was smaller in diameter, the cover was naturally thicker.

The compression of the resulting golf ball was 93. A barrel test resulted in 12 balls no failures. The cold cracking test resulted in 12 balls no failures. The guillotine test resulted in 12 balls, slight dent in the cover. The

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coefficient of restitution of the ball was 0.781. In the low speed rebound test, the ball bounced 73 inches.

#### EXAMPLE 6

Example 4 was repeated except that a center having the following physical properties was utilized. The center had a diameter of 1.540 inches, a coefficient of restitution of 0.800, a weight of 36.7 grams and a PGA compression of 83. A cover stock was formed in accordance with Example 4. Because the center was smaller in diameter, the cover was naturally thicker.

The compression of the resulting golf ball was 97. A barrel test resulted in 12 balls no failures. The cold cracking test resulted in 12 balls no failures. The guillotine test resulted in 12 balls, slight dent in the cover. The coefficient of restitution of the ball was 0.775. In the low speed rebound test, the ball bounced 73 inches.

#### EXAMPLE 7

Example 4 was repeated except that a center having the following physical properties was utilized. The center had a diameter of 1.530 inches, a coefficient of restitution of 0.802, a weight of 36.1 grams and a PGA compression of 84. A cover stock was formed in accordance with Example 4. Because the center was smaller in diameter, the cover was naturally thicker.

The compression of the resulting golf ball was 99. A barrel test resulted in 12 balls no failures. The cold cracking test resulted in 12 balls no failures. The guillotine test resulted in 12 balls, slight dent in the cover. The coefficient of restitution of the ball was 0.772. In the low speed rebound test, the ball bounced 71 inches.

#### EXAMPLE 8

In this example center C was utilized, a cover stock was formed by dry blending the components of Table 6.

TABLE 6

	Parts
Polypropylene Pro-Fax 6323*	49.25
Polypropylene Pro-Fax 8523*	49.25
Blowing agent Master Batch B	1.5

\*This material is manufactured by Hercules, Wilmington, Delaware.

The compression of the foam covered ball was 105. The resulting balls appeared to be normal golf balls. Two out of 2 golf balls passed the guillotine test, however, as a result of this test these balls showed greater marring than would be evident on a Surlyn covered golf ball sold by the Applicant under the trademark "TOP-FLITE". The coefficient of restitution of the ball was 0.734. In the low speed rebound test, the ball bounced 64 inches. In testing for the coefficient of restitution, the covers on 7 out of 12 balls cracked during testing. The 0.734 figure is an average of the balls which did not crack.

#### EXAMPLE 9

In this example center D was utilized. A cover stock was formed by dry blending the components of Table 6 above.

The compression of the foam covered ball was 95. Two out of 2 golf balls passed the guillotine test with marring similar to that described in Example 8 above. The coefficient of restitution of the ball was 0.739. In the low speed rebound test, the ball bounced 65 inches.

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In testing for the coefficient of restitution, the covers on 6 out of 12 balls cracked during testing. The 0.739 figure is an average of the balls which did not crack.

## EXAMPLE 10

In this example center C was utilized. A cover stock was formed by dry blending the components of Table 7.

TABLE 7

	Parts
High Density Polyethylene	98.5
Blowing agent Master Batch B	1.5

The resulting golf balls appeared to be normal golf balls. The compression of the foam covered ball was 110. Two out of 2 golf balls passed the guillotine test with marring similar to that described in Example 8 above. The coefficient of restitution of the ball was 0.719. In the low speed rebound test the ball bounced 66 inches. In testing for the coefficient of restitution, the covers on 10 out of 12 balls cracked during testing. The 0.719 figure is an average of the balls which did not crack.

## EXAMPLE 11

The procedure of Example 10 was utilized to make golf balls using center D. Again the resulting golf balls appeared to be normal golf balls. The compression of the foam covered ball was 100. The results of the guillotine test were identical to those described in Example 8. The coefficient of restitution of the ball was 0.726. In the low speed rebound test the ball bounced 63 inches. In testing for the coefficient of restitution, the covers on 9 out of 12 balls cracked during testing. The 0.726 figure is an average of the balls which did not crack.

## EXAMPLE 12

In this example center C was utilized. A cover stock was formed by dry blending the components of Table 8.

TABLE 8

	Parts
Thermoplastic rubber of the polyolefin blend type*	98.5
Blowing agent Master Batch B	1.5

\*As sold by Uniroyal Inc., New York, New York under the trademark "TPR 1900."

The compression of the foam covered ball was 85. The resulting balls appeared to be normal golf balls. Two out of 2 golf balls passed the guillotine test with marring similar to that described in Example 8 above. The coefficient of restitution of the ball was 0.756. In the low speed rebound test the ball bounced 61 inches.

## EXAMPLE 13

The procedure of Example 12 was utilized to make golf balls using center D. Again the resulting golf balls appeared to be normal golf balls. The compression of the resulting ball was 65. The results of the guillotine test were identical to those described in Example 8. The coefficient of restitution of the ball was 0.773. In the low speed rebound test the ball bounced 63 inches.

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## EXAMPLE 14

In this example center C was utilized. A cover stock was formed by dry blending the components of Table 9.

TABLE 9

	Parts
Thermoplastic Polyester Elastomer*	99.7
Facel EPA	.3

\*As sold by E. I. Du Pont De Nemours & Company, Inc., Wilmington, Delaware 19898 under the trademark "Hytrel 5526."

The compression of the foam covered ball was 100. The resulting balls appeared to be normal golf balls. The coefficient of restitution of the ball was 0.778. In the low speed rebound test the ball bounced 69 inches. The balls passed the guillotine test, with marring similar to that described in Example 8 above.

## EXAMPLE 15

The procedure of Example 14 was repeated to make golf balls using center D. The resulting golf balls appeared to be normal in appearance. The balls had a compression of 85. The coefficient of restitution of the ball was 0.785. In the low speed rebound test the ball bounced 71 inches. The balls passed the guillotine test with marring similar to that described in Example 8 above.

## EXAMPLE 16

In this example center C was utilized. A cover stock was formed by dry blending the components of Table 10.

TABLE 10

	Parts
Thermoplastic Polyurethane*	99.7
Facel EPA	.3

\*As sold by B. F. Goodrich Co., Akron, Ohio under the trademark "Estane 58133."

The resulting golf balls appeared to be normal in appearance. The balls passed the guillotine test. The compression of the foam covered ball was 95. The coefficient of restitution of the ball was 0.750. In the low speed rebound test the ball bounced 66 inches.

## EXAMPLE 17

Balls were made using the cover and procedure of Example 16. Center D was reduced in size to 1.53 and a coating applied to the windings to protect the windings from the high temperatures encountered during the molding of "Estane 58133." The resulting balls were normal in appearance. The balls had a compression of 80. The coefficient of restitution of the ball was 0.750. In the low speed rebound test the ball bounced 63 inches. The ball passed the guillotine test.

## EXAMPLE 18

In this example center C was utilized except that it was modified to have a compression of 85 and it was 1.59 inches in diameter. A cover stock was formed by casting a liquid thermoset polyurethane foam as sold by Hoover Universal, Ann Arbor, Mich., under the trademark "Reyn-o-SOL RU 6709," around the center as described above. The balls passed the guillotine test. They had a compression of 95 and a coefficient of resti-

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tution of 0.783. In the low speed rebound test the ball bounced 77 inches.

#### EXAMPLE 19

In this example center D was utilized and a cover cast around said center in accordance with the procedure of Example 18. The balls passed the guillotine test. They had a compression of 85 and a coefficient of restitution of 0.761. In the low speed rebound test the ball bounced 63 inches.

#### EXAMPLE 20

In this example center C was utilized, a cover stock was formed by dry blending the components of Table 11.

TABLE 11

	Parts
Polypropylene Pro-Fax 6323*	24.625
Polypropylene Pro-Fax 8523*	73.875
Blowing agent Master Batch B	1.5

\*This material is manufactured by Hercules, Wilmington, Delaware.

The compression of the foam covered ball was 95. The resulting balls appeared to be normal golf balls. Two out of 2 golf balls passed the guillotine test, however, as a result of this test these balls showed greater marring than would be evident on a Surlyn covered golf ball sold by the Applicant under the trademark "TOP-FLITE." The coefficient of restitution of the ball was 0.730. In the low speed rebound test, the ball bounced 58 inches. In testing for the coefficient of restitution, none of the balls cracked during testing in contrast to the results as discussed in Example 8 above.

#### EXAMPLE 21

In this example center C was utilized. A cover stock was formed by dry blending the components of Table 12.

TABLE 12

	Parts
High Density Polyethylene Having a Shore Hardness of 59-D	98.5
Blowing agent Master Batch B	1.5

The resulting golf balls appeared to be normal golf balls. The compression of the foam covered ball was 98. Two out of 2 golf balls passed the guillotine test with marring similar to that described in Example 20 above. The coefficient of restitution of the ball was 0.715. In the low speed rebound test the ball bounced 65 inches. In testing for the coefficient of restitution, the covers on 2 out of 12 balls cracked during testing. The 0.715 Figure is an average of the balls which did not crack. This example along with Example 10 shows that this invention is applicable to polyethylene and that cracking can be prevented or minimized by selecting a polyethylene having the proper hardness.

What is claimed is:

1. A golf ball having a center and a cover wherein said cover is formed from a cellular natural or synthetic polymer.

2. The golf ball of claim 1 wherein said cover has a uniform cellular cross section.

3. The golf ball of claim 1 wherein said cover has a variable cellular cross section.

4. The golf ball of claim 1 wherein said cover incorporates at least one noncellular skin.

5. The golf ball of claim 4 wherein said cover incorporates an outer noncellular skin and an inner noncellular skin adjacent to said center.

6. The golf ball of claim 4 wherein said cover incorporates an outer noncellular skin.

7. The golf ball of claim 4 wherein said cover incorporates an inner noncellular skin.

8. The golf ball of claim 1 wherein said center is solid.

9. The golf ball of claim 1 wherein said center is wound.

10. The golf ball of claim 1 wherein said cover is formed from a polymeric material selected from the group consisting of polyurethane resins, polyolefin resins and ionic copolymers of olefins having from 2 to 5 carbon atoms and a metal salt of an unsaturated monocarboxylic acid.

11. The golf ball of claim 2 wherein said cover is formed from a polymeric material selected from the group consisting of polyurethane resins, polyolefin resins and ionic copolymers of olefins having from 2 to 5 carbon atoms and a metal salt of an unsaturated monocarboxylic acid.

12. The golf ball of claim 3 wherein said cover is formed from a polymeric material selected from the group consisting of polyurethane resins, polyolefin resins and ionic copolymers of olefins having from 2 to 5 carbon atoms and a metal salt of an unsaturated monocarboxylic acid.

13. The golf ball of claim 4 wherein said cover is formed from a polymeric material selected from the group consisting of polyurethane resins, polyolefin resins and ionic copolymers of olefins having from 2 to 5 carbon atoms and a metal salt of an unsaturated monocarboxylic acid.

14. The golf ball of claim 1 wherein said cover is formed from a member selected from the group consisting of ionic copolymers of olefins having from 2 to 5 carbon atoms and the sodium salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms, and ionic copolymers of olefins having from 2 to 5 carbon atoms and a zinc salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms.

15. The golf ball of claim 2 wherein said cover is formed from a member selected from the group consisting of ionic copolymers of olefins having from 2 to 5 carbon atoms and the sodium salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms, and ionic copolymers of olefins having from 2 to 5 carbon atoms and a zinc salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms.

16. The golf ball of claim 3 wherein said cover is formed from a member selected from the group consisting of ionic copolymers of olefins having from 2 to 5 carbon atoms and the sodium salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms, and ionic copolymers of olefins having from 2 to 5 carbon atoms and a zinc salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms.

17. The golf ball of claim 4 wherein said cover is formed from a member selected from the group consisting of ionic copolymers of olefins having from 2 to 5 carbon atoms and the sodium salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms, and ionic copolymers of olefins having from 2 to 5 carbon atoms and a zinc salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms.

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18. The golf ball of claim 1 wherein said cover is formed from a mixture of ionic copolymers selected from the group consisting of ionic copolymers of olefins having from 2 to 5 carbon atoms and the sodium salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms, and ionic copolymers of olefins having from 2 to 5 carbon atoms and a zinc salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms.

19. The golfball of claim 2 wherein said cover is formed from a mixture of ionic copolymers selected from the group consisting of ionic copolymers of olefins having from 2 to 5 carbon atoms and the sodium salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms, and ionic copolymers of olefins having from 2 to 5 carbon atoms and a zinc salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms.

20. The golf ball of claim 3 wherein said cover is formed from a mixture of ionic copolymers selected from the group consisting of ionic copolymers of olefins having from 2 to 5 carbon atoms and the sodium salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms, and ionic copolymers of olefins having from 2 to 5 carbon atoms and a zinc salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms.

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21. The golf ball of claim 4 wherein said cover is formed from a mixture of ionic copolymers selected from the group consisting of ionic copolymers of olefins having from 2 to 5 carbon atoms and the sodium salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms and ionic copolymers of olefins having from 2 to 5 carbon atoms and a zinc salt of an unsaturated monocarboxylic acid having from 2 to 8 carbon atoms.

10 22. The golf ball of claim 5 wherein said cover is formed from a mixture comprising from about 75 to about 25 percent of a copolymer of ethylene and a sodium salt of an unsaturated monocarboxylic acid having from 3 to 8 carbon atoms and from about 25 to about 75 percent of a copolymer of ethylene and a zinc salt of an unsaturated monocarboxylic acid having from 3 to 8 carbon atoms.

20 23. The golf ball of claim 5 wherein said cover is formed from a mixture comprising from about 70 to about 30 percent of a copolymer of ethylene and a sodium salt of methyl acrylic acid and from about 30 to about 70 percent of a copolymer of ethylene and a zinc salt of methyl acrylic acid.

25 24. The golf ball of claim 5 wherein said cover is formed from a mixture comprising about 70 percent of copolymer of ethylene and a sodium salt of methyl acrylic acid and about 30 percent of a copolymer of ethylene and a zinc salt of methyl acrylic acid.

\* \* \* \* \*

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# EXHIBIT 4

**THIS EXHIBIT HAS BEEN  
REDACTED IN ITS ENTIRETY**

# EXHIBIT 5

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

CALLAWAY GOLF COMPANY )  
Plaintiff, )  
v. )  
ACUSHNET COMPANY, )  
Defendant. ) C. A. No. 06-91 (SLR)  
\_\_\_\_\_  
)

DECLARATION OF JAMES R. PROUDFIT

I, James R. Proudfit, hereby state as follows:

1. The statements I make herein are based on my own personal knowledge.
2. I am the named inventor on U.S. Patent No. 5,314,187 ("the '187 patent").

At the time of the application for the '187 patent, I was a Research Associate at Wilson Sporting Goods Co. ("Wilson"), the assignee of the '187 patent.

3. While at Wilson, I was personally and directly involved in the development of the Wilson Ultra Tour Balata golf ball, which was on sale in 1993.

4. The Wilson Ultra Tour Balata was a golf ball consisting of three components: a solid core, a blended ionomer inner cover layer, and an outer cover layer consisting of a composition of synthetic balata, polybutadiene, and other materials.

5. Specifically, the inner cover layer of the Wilson Ultra Tour Balata golf ball on sale in 1993 was the composition set forth in Table 6 of the '187 patent, which is a blend of the ionomers Surlyn® 8940 and Surlyn® 9910.

6. The outer cover layer of the Wilson Ultra Tour Balata golf ball on sale in 1993 was the composition set forth in Table 7 of the '187 patent.

I declare under the penalty of perjury according to the laws of the United States that the foregoing is true and correct to the best of my knowledge and belief. Executed on August 16, 2007, at Humboldt, CA.

  
JAMES R. PROUDFIT

# EXHIBIT 6

**THIS EXHIBIT HAS BEEN  
REDACTED IN ITS ENTIRETY**

# EXHIBIT 7

MANUAL OF  
PATENT  
EXAMINING  
PROCEDURE

Original Fourth Edition, Dated June 1979

Latest Revision September 1982



U.S. DEPARTMENT OF COMMERCE

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Rev. 9, Sept. 1982

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First Edition, November 1949  
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Third Edition, November 1961

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Revision 2, April 1980  
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Revision 4, October 1980  
Revision 5, January 1981  
Revision 6, June 1981  
Revision 7, July 1981  
Revision 8, October 1981  
Revision 9, September 1982

## PARTS, FORM AND CONTENT OF APPLICATION

## 608.01(p)

## → 608.01(p) Completeness [R-5]

Newly filed applications obviously failing to disclose an invention with the clarity required are discussed in § 702.01. A disclosure in an application, to be complete, must contain such description and details as to enable any person skilled in the art or science to which the invention pertains to make and use the invention as of its filing date. *In re Glass*, 181 USPQ 31; 492 F.2d 1228 (CCPA 1974).

While the prior art setting may be mentioned in general terms, the essential novelty, the essence of the invention, must be described in such details, including proportions and techniques where necessary, as to enable those persons skilled in the art to make and utilize the invention.

Specific operative embodiments or examples of the invention must be set forth. Examples and description should be of sufficient scope as to justify the scope of the claims. Markush claims must be provided with support in the disclosure for each member of the Markush group. Where the constitution and formula of a chemical compound is stated only as a probability or speculation, the disclosure is not sufficient to support claims identifying the compound by such composition or formula.

A complete disclosure should include a statement of utility. This usually presents no problem in mechanical cases. In chemical cases, varying degrees of specificity are required.

A disclosure involving a new chemical compound or composition must teach persons skilled in the art how to make the compound or composition. Incomplete teachings may not be completed by reference to subsequently filed applications.

## → A. GUIDELINES FOR CONSIDERING DISCLOSURES OF UTILITY IN DRUG CASES

*General*

These guidelines are set down to provide uniform handling of applications disclosing drug or pharmaceutical utility. They are intended to guide patent examiners and patent applicants as to criteria for utility statements. They deal with fundamental questions and are subject to revision and amendment if future case law indicates this to be necessary.

The following two basic principles shall be followed in considering matters relating to the adequacy of disclosure of utility in drug cases:

(1) The same basic principles of patent law which apply in the field of chemical arts shall be applicable to drugs, and

(2) The Patent and Trademark Office shall confine its examination of disclosure of utility to the application of patent law principles, recognizing that other agencies of the Government have been assigned the responsibility of assuring conformance to the standards established by statute for the advertisement, free sale or distribution of drugs. *In re Krimmel*, 48 CCPA 1116, 292 F.2d 948, 130 USPQ 215 (1961); *In re Hartop et al.*, 50 CCPA 780, 311 F.2d 249, 135 USPQ 419 (1962).

A drug is defined by 21 U.S.C. 321(g).

The term "drug" means (A) articles recognized in the official United States Pharmacopeia, official Homeopathic Pharmacopeia of the United States, or official National Formulary, or any supplement to any of them; and (B) articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals; and (C) articles (other than food) intended to affect the structure or any function of the body of man or other animals; and (D) articles intended for use as a component of any articles specified in clause (A), (B), or (C); but does not include devices or their components, parts, or accessories.

In addition, compositions adapted to be applied to or used by human beings, e.g., cosmetics, dentifrices, mouthwashes, etc., may be treated in the same manner as drugs subject to the conditions stated.

Any proof of a stated utility or safety required pursuant to these guidelines may be incorporated in the application as filed, or may be subsequently submitted by affidavit if and when required. The Patent and Trademark Office, in reaching its own independent decisions on questions of utility and how to use under 35 U.S.C. 101 and 112, will continue to avail itself of assistance and information from the Secretary of Health, Education, and Welfare as authorized by 21 U.S.C. 372(b), when necessary.

In accordance with the basic principles set forth above, the following procedures shall be followed in examining patent applications in the drug field with regard to disclosures relating to utility.

## 35 U.S.C. 101

Utility must be definite and in currently available form: (*Brenner v. Manson*, 383 U.S. 519, 148 USPQ 689) not merely for further investigation or research but commercial availability is not necessary. Mere assertions such as "therapeutic agents," (*In re Lorenz et al.*, 49 CCPA 1227, 305 F.2d 875, 134 USPQ 212; cf. *Ex parte Brockmann et al.*, 127 USPQ 57) "for pharmaceutical purposes," (*In re Diedrich*, 50

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## MANUAL OF PATENT EXAMINING PROCEDURE

CCPA 1355, 518 F.2d 946, 158 USPQ 128) "biological activity," (*In re Kirk et al.*, 54 CCPA 1119, 158 USPQ 48; *Ex parte Lanham*, 135 USPQ 106) "intermediate," (*In re Joly et al.*, 54 CCPA 1159, 153 USPQ 45; *In re Kirk et al.*, 54 CCPA 1119, 153 USPQ 48) and for making further unspecified preparations are regarded as insufficient.

If the asserted utility of a compound is believable on its face to persons skilled in the art in view of the contemporary knowledge in the art, then the burden is upon the examiner to give adequate support for rejections for lack of utility under this section (*In re Gazave*, 54 CCPA 1524, 154 USPQ 92). On the other hand, incredible statements (*In re Citron*, 51 CCPA 852, 325 F.2d 248, 139 USPQ 516; *In re Oberweiger*, 28 CCPA 749, 115 F.2d 826, 47 USPQ 455; *Ex parte Moore et al.*, 128 USPQ 8) or statements deemed unlikely to be correct by one skilled in the art (*In re Ruskin*, 53 CCPA 872, 334 F.2d 395, 148 USPQ 221; *In re Pottier*, 54 CCPA 1293, 153 USPQ 407; *In re Norak et al.*, 49 CCPA 1283, 306 F.2d 924, 134 USPQ 335. See also, *In re Irons*, 52 CCPA 938, 340 F.2d 974, 144 USPQ 351) in view of the contemporary knowledge in the art will require adequate proof on the part of applicants for patents.

Proof of utility under this section may be established by clinical or *in vivo* or *in vitro* data, or combinations of these, which would be convincing to those skilled in the art (*In re Irons*, 52 CCPA 938, 340 F.2d 924, 144 USPQ 351; *Ex parte Marshall*, 88 USPQ 131; *Ex parte Pennell et al.*, 99 USPQ 56; *Ex parte Ferguson*, 117 USPQ 229; *Ex parte Timmis*, 123 USPQ 581). More particularly, if the utility relied on is directed *solely* to the treatment of humans, evidence of utility, if required, must generally be clinical evidence. (*Ex parte Timmis*, 123 USPQ 581) although animal tests may be adequate where the art would accept these as appropriately correlated with human utility (*In re Hartop et al.*, 50 CCPA 780, 311 F.2d 249, 135 USPQ 419; *Ex parte Murphy*, 134 USPQ 134). If there is no assertion of human utility, (*Blincke v. Treres*, 44 CCPA 753, 241 F.2d 718, 112 USPQ 472; *In re Krimmel*, 48 CCPA 1116, 292 F.2d 948, 130 USPQ 215; *In re Dodson*, 48 CCPA 1125, 292 F.2d 943, 130 USPQ 224; *In re Hitchings*, 52 CCPA 1141, 342 F.2d 80, 144 USPQ 637) or if there is an assertion of animal utility, (*In re Bergel et al.*, 48 CCPA 1102, 292 F.2d 955, 130 USPQ 206; *Ex parte Melvin*, 155 USPQ 47) operativeness for use on standard test animals is adequate for patent purposes.

Exceptions exist with respect to the general rule relating to the treatment of humans. For example, compositions whose properties are generally predictable from knowledge of their components, such as laxatives, antacids, and certain topical preparations, require little or no clinical proof (*Ex parte Harrison et al.*, 129 USPQ 172; *Ex parte Lewis*, 140 USPQ 70).

Although absolute safety is not necessary to meet the utility requirement under this section, a drug which is not sufficiently safe under the conditions of use for which it is said to be effective will not satisfy the utility requirement (*In re Hartop et al.*, 50 CCPA 780, 311 F.2d 249, 135 USPQ 419). Proof of safety shall be required only in those cases where adequate reasons can be advanced by the examiner for believing that the drug is unsafe, and shall be accepted if it establishes a reasonable probability of safety.

## 35 U.S.C. 112

A mere statement of utility for pharmacological or chemotherapeutic purposes may raise a question of compliance with section 112, particularly "... as to enable any person skilled in the art to which it pertains ... to use the same." If the statement of utility contains within it a connotation of how to use, and/or the art recognizes that standard modes of administration are contemplated, section 112 is satisfied (*In re Johnson*, 48 CCPA 733, 282 F.2d 370, 127 USPQ 216; *In re Hitchings et al.*, 52 CCPA 1141, 342 F.2d 80, 144 USPQ 637) If the use disclosed is of such nature that the art is unaware of successful treatments with chemically analogous compounds, a more complete statement of how to use must be supplied than if such analogy were not present (*In re Mourea et al.*, 52 CCPA 1363, 345 F.2d 595, 145 USPQ 452; *In re Schmidt et al.*, 54 CCPA 1577, 153 USPQ 640). It is not necessary to specify the dosage or method of use if it is obvious to one skilled in the art that such information could be obtained without undue experimentation.

With respect to the adequacy of disclosure that a claimed genus possesses an asserted utility representative examples together with a statement applicable to the genus as a whole will ordinarily be sufficient if it would be deemed likely by one skilled in the art, in view of contemporary knowledge in the art, that the claimed genus would possess the asserted utility (*In re Oppenauer*, 31 CCPA 1248, 143 F.2d 974, 82 USPQ 297; *In re Carallito et al.*, 48 CCPA 711, 282 F.2d 337, 127 USPQ 202; *In re Carallito et al.*, 48 CCPA 720, 282 F.2d 363, 127 USPQ 206; *In re Schmidt*, 48 CCPA

## PARTS, FORM, AND CONTENT OF APPLICATION

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1140, 293 F.2d 274, 130 USPQ 404; *In re Cavallo*, 49 CCPA 1335, 306 F.2d 505, 131 USPQ 370; *In re Surrey*, 54 CCPA 855, 370 F.2d 349, 151 USPQ 724; *In re Land et al.*, 54 CCPA 1361, 153 USPQ 625). Proof of utility will be required for other members of the claimed genus only in those cases where adequate reasons can be advanced by the examiner for believing that the genus as a whole does not possess the asserted utility. Conversely, a sufficient number of representative examples, if disclosed in the prior art will constitute a disclosure of the genus to which they belong.

In the case of mixtures including a drug as an ingredient, or mixtures which are drugs, or methods of treating a specific condition with a drug, whether old or new, a specific example should ordinarily be set forth, which should include the organism treated. In appropriate cases, such an example may be inferred from the disclosure taken as a whole and/or the knowledge in the art (e.g., gargle).

Where the claimed compounds are capable of several different utilities and one use is adequately described in accordance with these guidelines, additional utilities will be investigated for compliance with sections 101 and 112 only if not believable on their face to those of ordinary skill in the art in view of the contemporary knowledge of the art. Failure to meet these standards may result in a requirement to cancel such additional utilities (*Ex parte Lanham*, 121 USPQ 223; *Ex parte Moore et al.*, 128 USPQ 8; *In re Citron*, 51 CCPA 852, 325 F.2d 248, 189 USPQ 516; *In re Gottlieb et al.*, 51 CCPA 1114, 328 F.2d 1016, 140 USPQ 665).

## B. INCORPORATION BY REFERENCE

An application as filed must be complete in itself in order to comply with 35 U.S.C. 112; however this does not bar incorporation by reference. *Ex parte Schwarze*, 151 USPQ 426 (Bd. of Appeals, 1968). An application for a patent when filed may incorporate "essential material" by reference to (1) a United States patent or (2) an allowed U.S. application, subject to the conditions set forth below. "Essential material" is defined as that which is necessary to (1) support the claims, or (2) for adequate disclosure of the invention (35 U.S.C. 112). "Essential material" may not be incorporated by reference to (1) patents or applications published by foreign countries or regional patent offices, to (2) nonpatent publications, to (3) a U.S. patent or application which itself incorporates "essential material" by reference or to (4) a foreign application. See *In re Fouche*, 169 USPQ 429; 429 F.2d 1237 (CCPA 1971).

Nonessential subject matter may be incorporated by reference to (1) patents or applications published by the United States or foreign countries or regional patent offices, (2) prior filed, commonly owned U.S. applications or (3) nonpatent publications, for purposes of indicating the background of the invention or illustrating the state of the art.

The referencing application must include (1) an abstract, (2) a brief summary of the invention, (3) an identification of the referenced patent or application, (4) at least one view in the drawing in those applications admitting of a drawing, and (5) one or more claims. Particular attention should be directed to specific portions of the referenced patent or application.

## Complete Disclosure Filed

If an application is filed with a complete disclosure, essential material may be cancelled by amendment and the *same* material substituted by reference to a patent or a pending and commonly owned allowed application in which the issue fee has been paid. The amendment must be accompanied by an affidavit or declaration executed by the applicant or his attorney or agent stating that the material cancelled from the application is the *same* material that has been incorporated by reference.

## Issue Fee Paid

If an application incorporates essential material by reference to a U.S. patent or a pending and commonly owned allowed U.S. application for which the issue fee has been paid, applicant will be required prior to examination to furnish the Patent and Trademark Office with a copy of the referenced material together with an affidavit or declaration executed by the applicant or his attorney or agent stating that the copy consists of the *same* material incorporated by reference in the referencing application. However, if a copy of a printed U.S. patent is furnished, no affidavit or declaration is required.

## Issue Fee Not Paid

If an application incorporates essential material by reference to a pending and commonly owned application other than one in issue with the fee paid, applicant will be required prior to examination to amend the disclosure of the referencing application to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant or his attorney or agent stating that the amendatory material consists of the *same* material incorporated by reference in the referencing application.

608.01(q)

## MANUAL OF PATENT EXAMINING PROCEDURE

*Improper Incorporation*

The filing date of any application wherein essential material is improperly incorporated by reference to a foreign application or patent or to a publication will not be affected because of the presence of such reference. In such a case, the applicant will be required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or his attorney or agent, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. *In re Hawkins*, 486 F.2d 569, 179 USPQ 157; *In re Hawkins*, 486 F.2d 579, 179 USPQ 163; *In re Hawkins*, 486 F.2d 577, 179 USPQ 167, (CCPA, 1973).

Reliance upon a commonly assigned copending application by a different inventor may ordinarily be made for the purpose of completing the disclosure. See *In re Fried et al.*, 141 USPQ 27, 51 CCPA 1118 (1964), and *General Electric Company v. Brenner*, 407 F.2d 1258 159 USPQ 335 (CADC 1968).

Since a disclosure must be complete as of the filing date, subsequent publications or subsequently filed applications cannot be relied upon to establish a constructive reduction to practice.

## C. DEPOSIT OF MICROORGANISMS

Some inventions which are the subject of patent applications depend on the use of microorganisms which must be described in the specification in accordance with 35 U.S.C. 112. No problem exists when the microorganisms used are known and readily available to the public. When the invention depends on the use of a microorganism which is not so known and readily available, applicants must take additional steps to comply with the requirements of § 112.

*In re Argoudelis, et al.*, 168 USPQ 99 (CCPA, 1970), accepted a procedure for meeting the requirements of 35 U.S.C. 112. Accordingly, the Patent and Trademark Office will accept the following as complying with the requirements of § 112 for an adequate disclosure of the microorganism required to carry out the invention:

(1) the applicant, no later than the effective U.S. filing date of the application, has made a deposit of a culture of the microorganism in a depository affording permanence of the deposit and ready accessibility thereto by the public if a patent is granted, under conditions which assure (a) that access to the culture will be available during pendency of the patent application to one determined by the Commissioner to be entitled thereto under 37 CFR 1.14 and

Rev. 8, Oct. 1981

35 U.S.C. 102, and (b) that all restrictions on the availability to the public of the culture so deposited will be irrevocably removed upon the granting of the patent.

(2) such deposit is referred to in the body of the specification as filed, and is identified by deposit number, name and address of the depository, and the taxonomic description to the extent available is included in the specification; and

(3) the applicant or his assigns has provided assurance of permanent availability of the culture to the public through a depository meeting the requirements of (1). Such assurance may be in the form of an averment under oath or by declaration by the applicant to this effect.

A copy of the applicant's contract with the depository may be required by the examiner to be made of record as evidence of making the culture available under the conditions stated above.

## D. SIMULATED OR PREDICTED TEST RESULTS OR PROPHETIC EXAMPLES

Simulated or predicted test results and prophetic examples (paper examples) are permitted in patent applications. Working examples correspond to work actually performed and may describe tests which have actually been conducted and results that were achieved. Paper examples describe the manner and process of making an embodiment of the invention which has not actually been conducted. Paper examples should not be represented as work actually done. No results should be represented as actual results unless they have actually been achieved. Paper examples should not be described using the past tense."

**NOTE.**—For problems arising from the designation of materials by trademarks and trade names, see § 608.01(v). [R-8]

## 608.01(q) Substitute or Rewritten Specification [R-8]

**37 CFR 1.125. Substitute specification.** If the number or nature of the amendments shall render it difficult to consider the case, or to arrange the papers for printing or copying, the examiner may require the entire specification or claims, or any part thereof, to be rewritten. A substitute specification will ordinarily not be accepted unless it has been required by the examiner.

The specification is sometimes in such faulty English that a new specification is necessary. In such instances a new specification should be required.

Under current practice, substitute specifications may be voluntarily filed by the applicant if he or she desires. A substitute specification

# EXHIBIT 8

**THIS EXHIBIT HAS BEEN  
REDACTED IN ITS ENTIRETY**

# EXHIBIT 9



US005314187A

# United States Patent [19]

Proudfit

[11] Patent Number: 5,314,187  
 [45] Date of Patent: May 24, 1994

## [54] GOLF BALL WITH IMPROVED COVER

[75] Inventor: James R. Proudfit, Humboldt, Tenn.

[73] Assignee: Wilson Sporting Goods Co., Chicago, Ill.

[21] Appl. No.: 905,895

[22] Filed: Jun. 29, 1992

## Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 733,789, Jul. 26, 1991, abandoned.

[51] Int. Cl.<sup>5</sup> ..... A63B 37/12

[52] U.S. Cl. ..... 273/235 R; 273/233; 273/218; 273/228; 273/DIG. 22; 525/193; 525/123; 525/236; 264/250

[58] Field of Search ..... 525/193, 123, 236; 273/235 R, 230, 218, 233

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Primary Examiner—James J. Seidleck

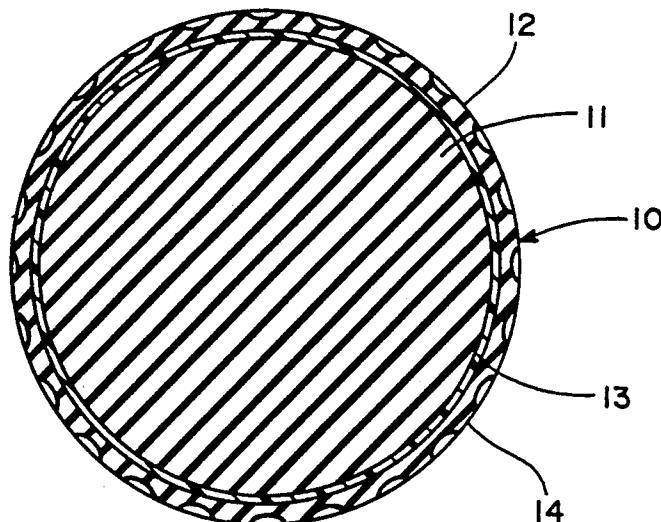
Assistant Examiner—I. Zemel

[57]

## ABSTRACT

A golf ball includes a core and a cover which is formed from two separate inner and outer layers. The inner layer is molded over the core and is formed from ionomer resin. The outer layer is molded over the inner layer and is formed from a blend of natural or synthetic balata and a crosslinkable elastomer such as polybutadiene. The elastomer is thermally crosslinked with a metallic salt of an unsaturated fatty acid, such as zinc diacrylate, and a crosslinking initiator such as organic peroxide.

25 Claims, 3 Drawing Sheets



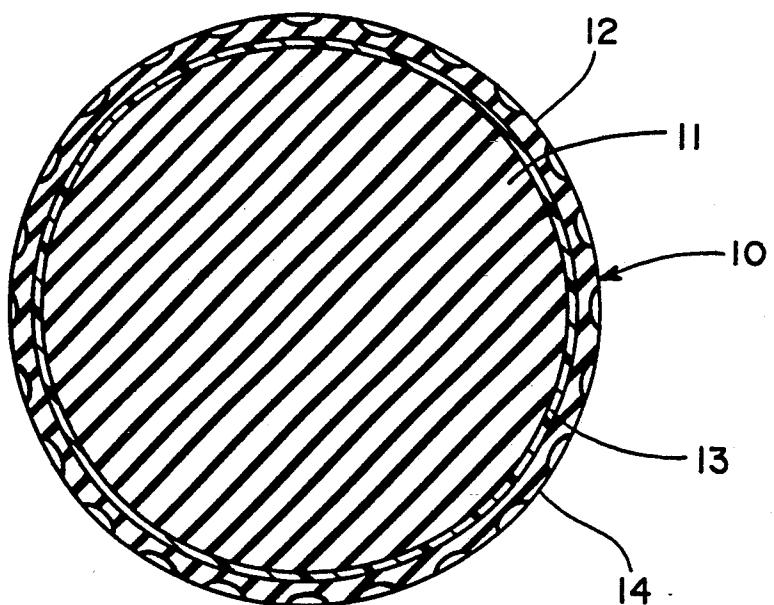
**U.S. Patent**

May 24, 1994

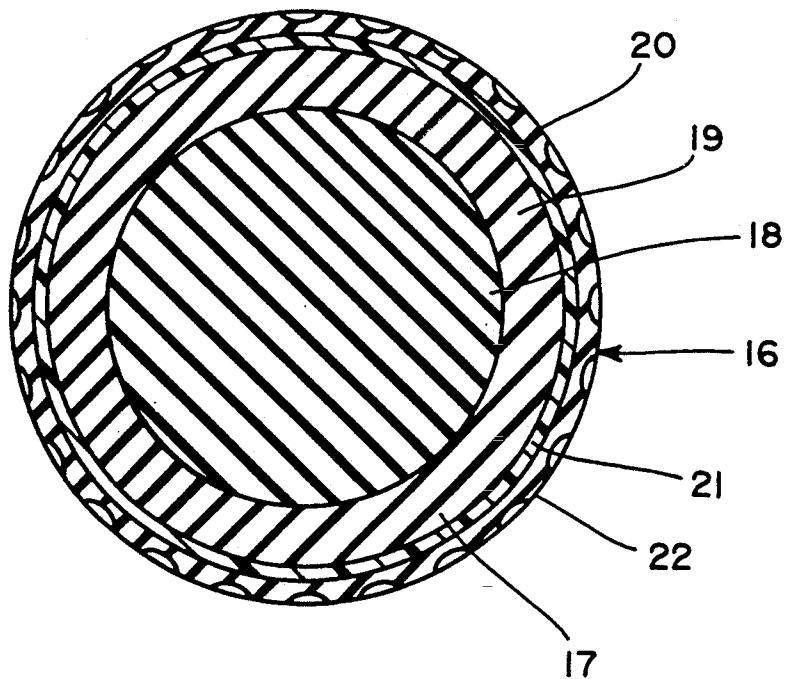
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**Fig. 1**



**Fig. 2**



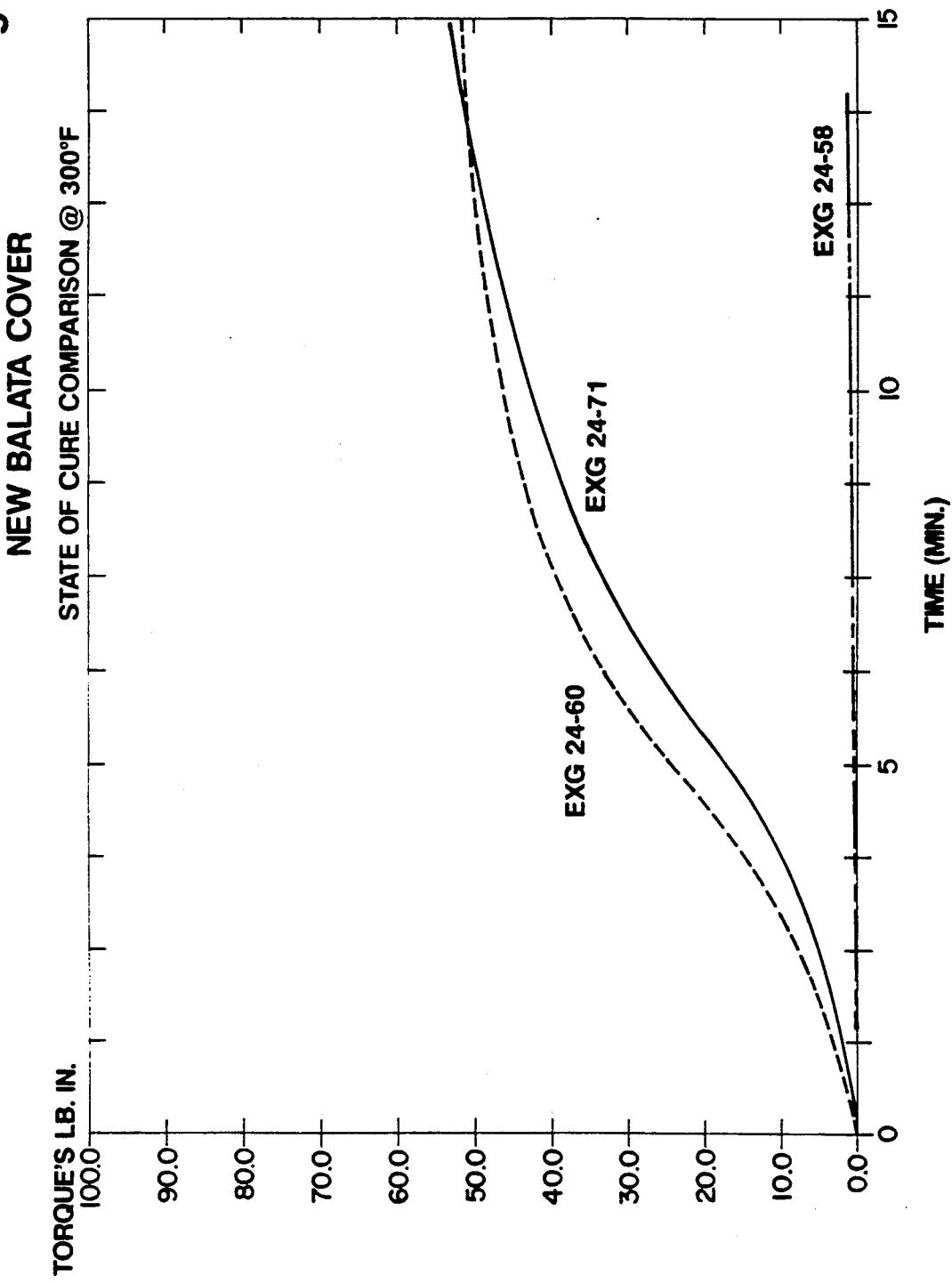
U.S. Patent

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Fig. 3



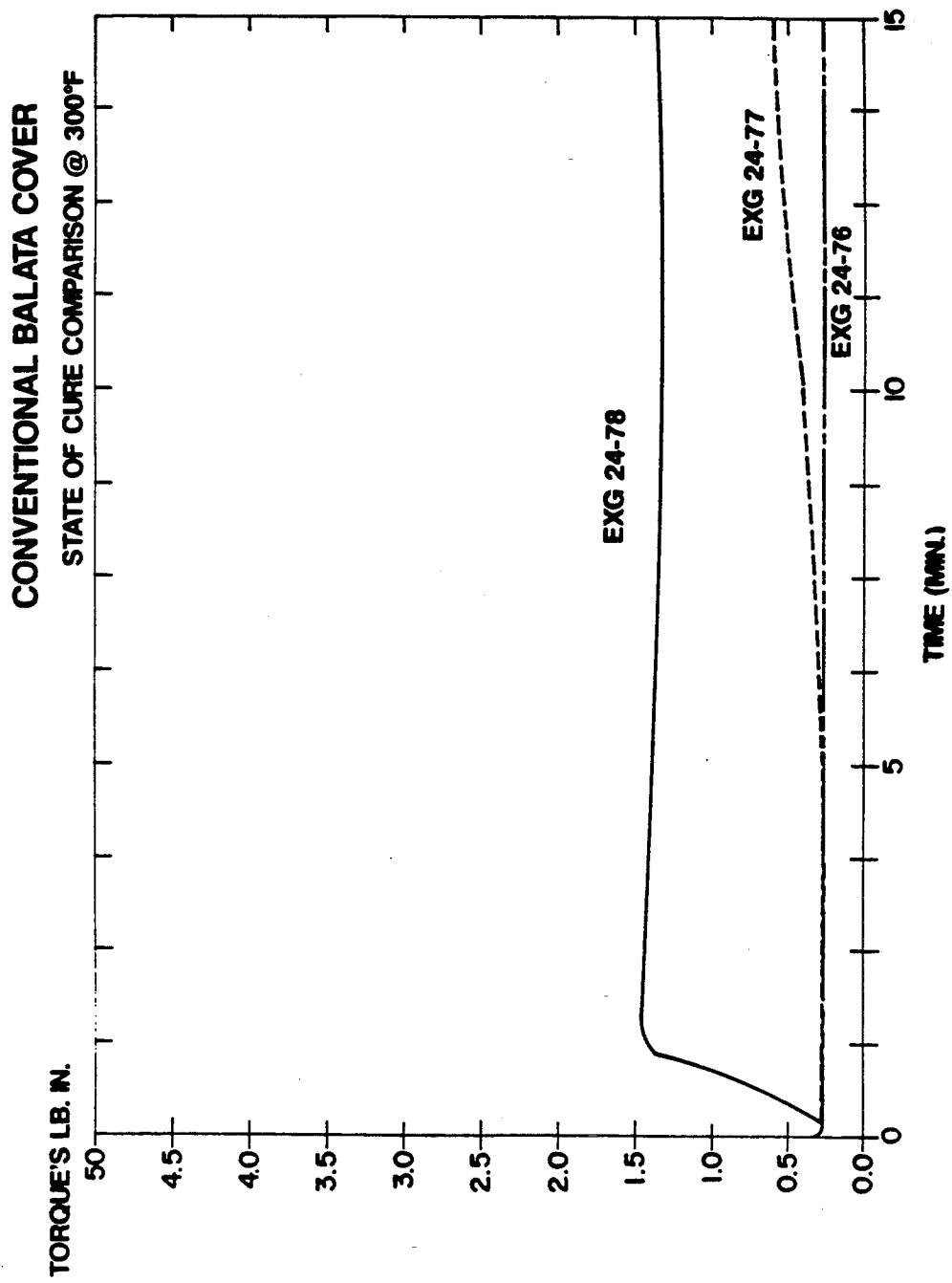
U.S. Patent

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Fig. 4



## GOLF BALL WITH IMPROVED COVER

## RELATED APPLICATION

This application is a continuation-in-part application of my co-pending application entitled "Golf Ball with Improved Cover," Ser. No. 733,789, filed Jul. 26, 1991, now abandoned.

## BACKGROUND

This invention relates to golf balls, and, more particularly, to a golf ball having a two-layer cover. The inner layer is formed from hard resin material such as ionomer resin, and the outer layer is formed from soft material such as balata or a blend of balata and other elastomers.

Golf balls which are currently available fall into two general categories—balls which include a balata cover and balls which include a more durable, cut-resistant cover. Balata covers are made from natural balata, synthetic balata, or a blend of natural and synthetic balata. Natural rubber or other elastomers may also be included. Synthetic balata is trans polyisoprene and is commonly sold under the designation TP-301 available from Kuraray Isoprene Company Ltd.

Most cut-resistant covers utilize Surlyn ionomers, which are ionic copolymers available from E. I. du Pont de Nemours & Co. Surlyn ionomers are copolymers of olefin, typically ethylene, and an alpha-beta ethylenically unsaturated carboxylic acid, such as methacrylic acid. Neutralization of a number of the acid groups is effected with metal ions, such as sodium, zinc, lithium, and magnesium. DuPont's U.S. Pat. No. 3,264,272 describes procedures for manufacturing ionic copolymers. Ionic copolymers manufactured in accordance with U.S. Pat. No. 3,264,272 may have a flexural modulus of from about 14,000 to about 100,000 psi as measured in accordance with ASTM method D-790. DuPont's U.S. Pat. No. 4,690,981 describes ionic copolymers which include a softening comonomer. Ionic copolymers produced in accordance with U.S. Pat. No. 4,690,981 are considered "soft" ionic copolymers and have a flexural modulus of about 2800 to about 8500 psi.

Other cut-resistant materials which can be used in golf ball covers are ionic copolymers available from Exxon under the name Iotek, which are similar to Surlyn ionic copolymers except that acrylic acid is used rather than methacrylic acid.

A number of golfers, primarily professional and low handicap golfers, prefer balata covered balls because of the higher spin rate, control, "feel," and "click" which balata provides. "Feel" is the overall sensation imparted to a golfer when the ball is hit, and "click" refers to the sound made when the clubhead hits the ball. However, balata covered balls are more expensive and are less resistant to cutting than Surly covered balls.

Conventional balata covered 3 piece golf balls are produced by winding resilient, low heat-resistant elastic thread over a soft rubber or liquid rubber center, which must first be frozen to permit winding the rubber thread, and molding a conventional soft balata cover over the windings. The balata is conventionally vulcanized or crosslinked by using sulfur as the crosslinker or vulcanizing agent.

This process has proven to be very costly and requires numerous extra production steps in manufacture, extended cure time frames in hot room areas, and specified ambient conditions in order to complete the sulfur

crosslinking system. The procedures limit the consistency of the crosslinking, reduce the ability to initiate good work-in-process production procedures and maintain normal inventory levels, and limit the time frame after ball finishing for final cover crosslinking which develops the final physical properties of the cover and the ball.

In addition, conventional processing methods for balata covered balls produce relatively low yields of good cosmetic quality balls because the additional processing steps which are required before complete cover crosslinking occurs can damage the cover surface. Also, extra steps are required in conventional balata ball production methods including chlorination and ball rinses to prepare the cover surface for acceptable paint adhesion to the balata surface. Multiple coats of pigmented paint are normally applied prior to logo stamping, then a final clear, two component or ultra violet curable coating is applied to protect the ball surface and logo.

While the ball is played, additional paint durability problems may be exhibited in the form of scuffing and micro cracking. Balata golf balls produced using the conventional process methods also suffer from color and color stability problems.

Surlyn covered balls are cheaper than balata balls not only because Surlyn is cheaper than balata but because the Surlyn balls can be processed after molding much easier and faster than balata balls. The substantial processing differences between balata balls and Surlyn balls can be seen by comparing Tables 1 and 2, which describe the conventional processing steps for manufacturing 3 piece balata and 3 piece Surlyn golf balls. The term "3 piece" is commonly used to refer to a golf ball which has a center, a layer of elastic windings over the center, and a cover. The term "2 piece" is used to refer to a golf ball which has a solid core and a cover. Table 3 describes the conventional processing steps for a 2 piece Surlyn golf ball. The processing steps described in Tables 1-3 are well known in the golf ball industry, and a detailed description thereof is unnecessary.

TABLE 1

## Conventional 3 Piece Balata Process

1. center rubber compound mixed
2. mill and preform pellets
3. mold center
4. center flash removed
5. freeze center
6. wind core (conventional elastic thread)
7. compression mold heated preform pellets into single halfshells
8. place halfshells over wound core
9. compression mold balata balls Note: cover is only partially crosslinked after this molding step.
10. freeze molded ball prior to buffing
11. remove balls and transfer to fiberglass bags
12. transport frozen balls to holding freezer
13. seam buff ball being careful not to buff seam too deep because of the soft cover
14. grade balls after seam buff for quality level
15. cure balata ball cover in alcohol/RR2 crystals solution, (7 hours soak)
16. remove balls from solution and water rinse
17. transport balls into hot room to cure for 7 days
18. before removing balls from room use benzene test method to insure proper cover cure

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19. remove balls from cure room and soak in acetone, (hazard solvent disposal necessary)
20. remove balls from acetone and allow to air dry
21. chlorination process using hydrochloric acid and sodium hypochlorite; load balls into solution tank (must be done in an exhausted area for safety), (chlorination solution must be neutralized before discharge into city sewer drain)
22. remove balls and rinse in clear water tank, up and down motion
23. remove and repeat in second tank
24. remove and repeat in third tank
25. remove and rinse in acetone tank
26. apply primer
27. apply 1st top coat
28. pad print logo
29. apply clear top coat
30. inspect and package

TABLE 2  
Conventional 3 Piece Surlyn Process

1. center rubber compound mixed
2. mill and preform slug
3. mold center
4. center flash removed
5. wind center (conventional elastic thread)
6. injection mold halfshells
7. place halfshells over core
8. compression mold ball
9. seam buff parting line
10. vibratory finish ball
11. apply primer
12. pad print logo
13. apply clear top coat
14. inspect and package

TABLE 3  
Conventional 2 Piece Surlyn Process

1. core rubber compound mixed
2. mill and preform slug
3. mold core
4. centerless grind core to size
5. injection mold Surlyn cover around core
6. seam buff parting line
7. vibratory finish ball
8. apply primer
9. pad print logo
10. apply clear top coat
11. inspect and package

The balata cover is not fully cured and crosslinked until the 7 day cure step of step No. 17 in Table 1 is completed. As a result, the partially cured balata balls require more careful handling and additional process steps than the Surlyn balls. For example, after the balata balls are removed from the mold they must be frozen before the parting line seam on each ball is buffed. Also, because the balata covers are softer, they must be examined more carefully for defects which could be caused by the processing steps.

#### DESCRIPTION OF PRIOR ART GOLF BALL CURING SYSTEMS

As stated previously, balata covers are generally vulcanized or cured using sulfur as the vulcanizing agent. Sulfur is included in the cover composition in an amount of about 1 to 2% by weight of the balata. The vulcanizing occurs during the final molding operation in which two hemispherical halfshells of the cover are

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molded over the thread-wound core in a compression mold. However, the molding temperature and time is limited by the threads, which can be damaged by high heat. Accordingly, the cover is not fully cured when it is removed from the mold and requires the exposure as described in Table 1, step 15 to accelerate the cure through migration of the RR2 crystals accelerator material into the cover cross sectional area to complete the vulcanization of the cover. RR2 crystals are the reaction product of 1,1 methylene dipiperidine and carbon disulfide and are available from Rockland React-Rite, Inc. of Rockmart, Ga. RR2 crystals are dissolved in isopropyl alcohol solvent in the amount of about 10% by weight of crystals to about 90% by weight of alcohol.

By way of example, one specific commercial balata covered ball which was sold by Wilson Sporting Goods Co. had the cover composition described in Table 4.

20 TABLE 4

Prior Art Balata Cover Composition (Parts by Weight)		
25	Trans Polyisoprene	84.00
	Natural Rubber or Polyisoprene	16.00
	ZnO	13.00
	TiO <sub>2</sub>	17.00
	Blue Toner	0.20
	Stearic Acid	0.26
30	Thiozole Accelerator	0.26
	Sulfur	1.20
Total		131.92

This system was not completely crosslinked until steps 15 through 17 were performed in Table 1.

35 The Zinc Oxide was used as a filler and a gravity adjuster. The blue toner was used to enhance the white color and was Ultramarine Blue from Whittaker, Clark & Daniels, Inc. of South Plainfield, N.J.

Two piece or solid golf balls conventionally include a 40 core which includes a thermally crosslinkable elastomer such as polybutadiene. The polybutadiene is cured or crosslinked by including in the core composition a crosslinking agent and a crosslinking initiator. Common crosslinking agents are zinc salts of monocarboxylic acids such as zinc diacrylate, zinc acrylate, and zinc methacrylate. The crosslinking initiator provides free radicals, and common crosslinking initiators are organic peroxides such as dicumyl peroxide.

45 U.S. Pat. Nos. 3,784,209, 4,065,537, 4,266,772, 4,483,537, 4,683,257, 4,688,801, 4,714,253, and 4,715,607 describe various solid cores for golf balls which include elastomers such as polybutadiene which are cured or crosslinked by zinc diacrylate and peroxide or similar ingredients.

50 55 U.S. Pat. Nos. 4,792,141 and 4,931,376 describe golf ball covers which include blends of balata and elastomers such as polybutadiene and trans polyoctenylene rubber. However, the rubber compositions are cured by the conventional sulfur curing technique.

60 U.S. Pat. No. 4,884,814 describes a golf ball cover which is formed from a blend of "hard Surlyn" and "soft Surlyn". The hard Surlyn is described as a high modulus ionomer having a flexural modulus of from about 30,000 to 55,000 psi as measured in accordance with A.S.T.M. Method D-790. The soft Surlyn is described as a low modulus ionomer having a flexural modulus of from about 3,000 to about 7,000 psi.

U.S. Pat. No. 4,431,193 describes a golf ball with a two-layer cover. The inner layer is formed from a hard ionomer resin having a high flexural modulus, and the outer layer is formed from a soft ionomer resin having a low flexural modulus.

#### SUMMARY OF THE INVENTION

The invention provides a golf ball which has many of the desirable features of balata covered balls but is more durable, more cut-resistant, and easier and less expensive to manufacture than conventional balata covered balls.

A golf ball cover in accordance with the invention includes an inner layer formed from a relatively hard, cut-resistant material such as ionomer resin and an outer layer of soft material such as balata or a blend of balata and other elastomers. Preferably, the outer layer is a blend of balata and a thermally crosslinkable elastomer such as polybutadiene. The balata and elastomer are crosslinked during the molding of the ball by a cross-linker such as zinc diacrylate and a crosslinking initiator such as organic peroxide rather than using the conventional sulfur and RR2 crystals curing system for balata covers. The outer layer of the cover is completely crosslinked when the ball is removed from the mold, and subsequent processing steps can be performed in the same manner as on Surlyn covered balls. The inner layer of the cover provides good cut resistance, and the outer layer provides the sound, feel, and spin characteristics of a balata cover. The cover can be used in either 2 piece or 3 piece balls.

#### DESCRIPTION OF THE DRAWING

FIG. 1 is a cross section of a two piece ball formed in accordance with the invention;

FIG. 2 is a cross section of a three piece ball formed in accordance with the invention; and

FIGS. 3 and 4 are rheology charts showing curing comparisons of various balata covers.

#### DESCRIPTION OF SPECIFIC EMBODIMENTS OF THE INVENTION

The cover of the invention is formed from two layers—an inner layer which is molded over a solid or a wound core and an outer layer which is molded over the inner layer. The inner layer is formed from a relatively hard, cut-resistant material such as ionomer resin, and the outer layer is formed from relatively soft material such as elastomeric or polymeric material selected from the class consisting of natural balata, synthetic balata, natural rubber, polybutadiene, and polyoctenylene rubber. Polyoctenylene rubber having a high trans content is available under the trade name Vestenamer from Huls Corp. of West Germany. Particular grades of Vestenamer which are suitable are Vestenamer 8012 and Vestenamer 6213.

The ionomers used for the inner layer are available from E. I. du Pont de Nemours & Co. under the name Surlyn and from Exxon under the name Iotek. Surlyn resins are described in U.S. Pat. No. 3,264,272. As described in that patent, various metal ions can be used to neutralize the acid groups, including sodium, zinc, lithium, and magnesium. The ionomer resins generally fall into three categories which are characterized by hardness or stiffness—standard, high modulus, and low modulus. The standard resins have a flexural modulus in the range of about 30,000 to about 55,000 psi as measured by ASTM Method D-790. (Standard resins are referred to

as "hard Surlyns" in U.S. Pat. No. 4,884,814.) The high modulus resins have a flexural modulus in the range of about 55,000 to about 100,000 psi. The low modulus resins have a flexural modulus in the range of about 5 2800 to about 8500 psi.

Specific standard Surlyn resins which can be used in the inner layer include 8940 (sodium), 9910 (zinc), 7930 (lithium). Specific standard Iotek resins which can be used include 8000 (sodium), 8020 (sodium), 8030 (sodium), 4000 (zinc), and 4010 (zinc).

Low modulus ionomers are described in U.S. Pat. No. 4,690,981 and include a softening comonomer. Specific low modulus Surlyns which can be used in the inner layer include 8120 (sodium), 8320 (sodium), and 15 9320 (zinc).

Specific high modulus Surlyns which can be used in the inner layer include 8220 (sodium), 8240 (sodium), 9220 (zinc), and AD-8181 (lithium).

The ionomer resins can be used alone or in blends of 20 two or more types of ionomers, for example, blends of sodium/zinc ionomers, sodium/lithium ionomers, zinc/lithium ionomers, and sodium/zinc/lithium ionomers. Blends of ionomers of different stiffness can also be used, for example, blends of standard/high modulus ionomers, standard/low modulus ionomers, low/high modulus ionomers, and low/standard/high modulus ionomers.

The relatively soft elastomeric material of the outer layer has a flexural modulus in the range of about 20,000 to 25,000 psi, and in one specific embodiment had a flexural modulus of from 22,165 to 22,379 psi.

The outer layer preferably comprises a blend of balata and one or more thermally crosslinkable elastomeric polymers. The balata can be either natural or synthetic 35 balata or a blend of both. The thermally crosslinkable elastomers can be those which have heretofore been used in core compositions of golf balls, for example, as described in U.S. Pat. Nos. 3,784,209, 4,065,37, 4,266,772, 4,483,537, 4,683,257, 4,688,801, 4,714,253, 40 and 4,715,607.

As described in those patents, suitable crosslinkable elastomers include homopolymers, copolymers or terpolymers of butadiene, isoprene or chloroprene. Preferably, the elastomer is 1,4 polybutadiene having a cis structure in a proportion of at least 40%. Most preferably the polybutadiene rubber contains at least 90% and even more preferably at least 95% of cis-1,4 bonds. If desired, natural rubbers, polyisoprene rubbers, styrene/butadiene rubbers, or the like may be blended with the polybutadiene rubber. Another suitable elastomer is polyoctenylene rubber having a high trans content.

The crosslinking agent can be one or more metallic salts of unsaturated fatty acids or monocarboxylic acids, particularly, zinc, calcium or magnesium salts of acrylic acid and methacrylic acid. Zinc diacrylate, zinc acrylate, and zinc methacrylate are particularly suitable.

Any of a number of known crosslinking initiators can be used. These initiators supply free radicals and include various organic peroxides such as dicumyl peroxide and 60 n-Butyl-4, 4-bis (t-butylperoxy) valerate on calcium silicate, which is available from R. T. Vanderbilt, Inc. of Norwalk, Conn. under the trademark Varox 230XL. Suitable crosslinking agents and crosslinking initiators are described in the aforementioned patents which describe polybutadiene cores.

The balata is preferably present in a amount ranging from 25% to 99% of the total polymer content of the outer layer of the cover. The balance of the polymer

content, namely from 75% to 1% of the total polymer content, is preferably provided by polybutadiene having a high cis-1,4 content, but other suitable crosslinkable elastomers such as natural rubber, Vestenamer, etc. can be blended with the polybutadiene as desired.

The amount of the crosslinking agent generally ranges from 20 to 50 parts by weight of the total polymer content of the outer layer, and is preferably about 35 to 45 parts by weight.

The amount of the crosslinker initiator can range from about  $\frac{1}{2}$  to  $3\frac{1}{2}$  parts by weight of the total polymer content of the outer layer, and preferably is about 2 to  $2\frac{1}{2}$  parts by weight.

Any suitable filler, for example zinc oxide, can be added to both the inner and outer layers of the cover. Zinc oxide not only acts as a filler and as a gravity adjuster but may also provide crosslinking. Other conventional ingredients may also be included, such as titanium dioxide and Ultramarine Blue.

FIG. 1 illustrates a two-piece golf ball 10 which includes a solid core 11 and a cover 12 which comprises a relatively hard inner layer 13 of one or more ionomer resins and a relatively soft outer layer 14 of polymeric material. The solid core can be formed in the conventional manner.

FIG. 2 illustrates a three-piece golf ball 16 which includes a wound core 17 which comprises a center 18 and a layer 19 of windings of elastic thread. The center may be solid or a liquid filled balloon. Such wound cores are also conventional. A cover 20 includes a relatively hard inner layer 21 of one or more ionomer resins as previously described and a relatively soft outer layer 22 of polymeric material as previously described.

The diameter of the core of either the two-piece or the three-piece ball can be within the range of about 1.000 to 1.500 inch. The thickness of the inner layer can be within the range of about 0.0250 to 0.2875 inch to provide a total diameter of the inner layer and core within the range of about 1.550 to 1.590 inch. The thickness of the outer layer can be within the range of about 0.0450 to 0.0650 inch to provide a total ball diameter of 1.680 inch. The preferred dimensions are a core diameter of 1.500 inch, an inner layer thickness of 0.037 inch (inner layer diameter of 1.575 inch), and an outer layer thickness of 0.0525 inch (total ball diameter of 1.680 inch).

#### EXAMPLE I

Two specific solid core compositions used with the new two-layer cover had the composition described in Table 1. One core was used in a golf ball which was designated as a 90 compression ball, and the other core was used in a golf ball which was designated as a 100 compression ball.

TABLE 5

	Composition of Core (Parts by Weight)	
	90 Compression	100 Compression
Polybutadiene Rubber	95.00	95.00
Vestenamer 8012	5.00	5.00
Zinc Oxide	12.20	11.10
Zinc DiAcrylate	35.00	38.00
Antioxidant	0.80	0.80
Peroxide (Luperco 101 XL)	0.80	0.80
Liquid Monomer SR-351 (TMPTA)	5.00	5.00

TABLE 5-continued

	Composition of Core (Parts by Weight)	
	90 Compression	100 Compression
Total	153.80	156.80

The antioxidant was 2,2'-Methylenebis (4-methyl-6-tertbutylphenol) which was obtained from R. T. Vanderbilt Co. of Norwalk, Conn. under the trade name Vanox MBPC.

The peroxide is an organic peroxide available from Atochem North America Inc., Philadelphia, Pa.

The Liquid Monomer is Trimethylolpropane Triacrylate available from Sartomer, Westchester, Pa.

The core was processed according to the conventional steps:

1. core rubber compound mixed
2. mill and preform slug
3. mold core
4. centerless grind core to size.

The composition of the inner layer of the cover is described in Table 6.

TABLE 6

	Composition of Inner Layer of Cover (Parts by Weight)	
	Ionomer Type	Blend Ratio
Sodium- Surlyn 8940	75%	
Zinc- Surlyn 9910	25%	

The inner layer can be molded in one of two methods:

1. Injection molded over the core in a manner which is conventionally used to injection mold ionomers over a solid core.
2. Injection mold halfshells, place halfshells over the core, compression mold the inner cover over the core.

After either method of molding the inner layer is completed, the surface is centerless ground to a preferred size of 1.575 inch in diameter prior to the final cover molding step.

The composition of the outer layer of the cover is described in Table 7.

TABLE 7

	Composition of Outer Layer (Parts by Weight)	
	Trans PolyIsoprene (TP-301)	60.00
Polybutadiene		40.00
Zinc Oxide		5.00
Titanium DiOxide		17.00
Ultramarine Blue color		.50
Zinc DiAcrylate		35.00
Peroxide (Varox 230 XL)		2.50
Total		160.00

Ultramarine Blue is a blue toner which is used to enhance the white color of the cover and is available from Whittaker, Clark & Daniels, Inc. of South Plainfield, N.J.

The outer layer of the cover was made by conventional mixing and molding procedures. The components of the composition are mixed on a mill such as a two roll mill to form slabs. Slabs are fed into a dicer which cubes the cover compound prior to the injection molding to form generally hemispherical halfshells. The halfshells are placed about the inner layer of the ball in a compression molding machine which fuses the halfshells to each

other and to the inner layer. The compression molding operation is carried out under a temperature of about 250° to 350° F. for about 5 to 10 minutes. The molding temperature causes the elastomer to crosslink, and it is believed that the ball is fully crosslinked when it is removed from the compression mold.

The outer layer composition can also be used in a conventional injection molding machine to form an injection molded outer layer about the inner layer.

The rheology chart of FIG. 3 shows that the cross-linking agent causes crosslinking of not only the polybutadiene but also of the balata and that the composition is fully crosslinked after the molding operation. The rheology chart was prepared by tests conducted on a Monsanto Moving Die Rheometer MDR 2000 available from Monsanto Instruments & Equipment of Akron, Ohio. The rheometer is used to measure cure characteristics of rubber and measures the reaction torque as a function of cure time or degree of vulcanization. Curing was performed at 300° F.

FIG. 3 compares the following outer layer compositions.

EXG24-60: from Table 8

EXG24-71: same as EXG24-60 but without polybutadiene (100% TP301)

EXG24-58: same as EXG24-60 but without polybutadiene and peroxide

TABLE 8

	EXG24-60
Trans-Polyisoprene TP-301	84.00
Polybutadiene	16.00
ZnO	13.00
ZDA	35.00
TiO2	17.00
Ultramarine Blue	.50
Peroxide (Varox 230XL)	2.50
Total	168.00

EXG24-58 without peroxide exhibits very poor curing characteristics. The other two formulas have comparable curves, which indicate that the composition which includes balata and polybutadiene is just as crosslinkable as the composition which contains only balata and no polybutadiene.

FIG. 4 is a rheology chart which compares the three outer layer compositions set forth in Table 9:

TABLE 9

	EXG24-78	EXG24-77	EXG24-76
Trans Polyisoprene	84.00	84.00	84.00
Natural Rubber	16.00	16.00	16.00
ZnO	13.00	13.00	13.00
TiO 2	17.00	17.00	17.00
Ultramarine Blue	.20	.20	.20
Stearic Acid	.26	.26	.26
Thiozole Accelerator	.26	.26	.26
Sulfur	1.20	1.20	—
RR-2 Crystals	1.50	—	—
Total	133.42	131.92	130.72

Formula EXG24-78 is comparable to a conventional prior art balata cover which is cured by sulfur and the step of soaking the completed ball in an alcohol/RR2 crystal solution described in Step No. 15 of Table 1. However, in order to test the composition on the MDR 2000 Rheometer the RR2 crystals were incorporated into the composition to simulate the subsequent soaking step.

Formula EXG24-77 is the same as formula EXG24-78 but omits the RR2 crystals. Formula EXG24-76 is

the same as formula EXG24-78 but omits both sulfur and the RR2 crystals.

It is significant to note the difference between the cure rheology of the balata compositions illustrated in FIG. 4 and the new balata compositions cured by zinc diacrylate and peroxide illustrated in FIG. 3. The rheology physical properties for the compositions in FIG. 4 are so low compared to the compositions of FIG. 3 that the scale of FIG. 4 had to be changed from 0 to 100 torque units to 0 to 5 torque units in order to be meaningful. The cover composition of formula EXG24-60 of FIG. 3 has significantly higher torque than formula EXG24-78 of FIG. 4. Also, the rheology cure curve for formula EXG24-78 shows reversion, while the cure curve of formula EXG24-60 shows essentially a curve which is flatlined.

Because the balata-containing outer layer of the cover in accordance with the invention is fully crosslinked after the molding operation, the golf balls can be processed in a manner in which is very similar to the processing of Surlyn covered balls, thereby greatly facilitating the additional processing steps and reducing the overall cost of the balls. The processing steps for 3 piece and 2 piece balls formed in accordance with the invention are described in Tables 10 and 11, and these processing steps can be compared with the steps described in Tables 1-3.

TABLE 10

## New 3 Piece Process

- 1 center rubber compound mixed
2. mill and preform slug
3. mold center
4. center flash removed
5. wind center with heat resistant thread
6. injection mold halfshells for the inner layer of the cover
7. place the halfshells of the inner layer over the core
8. compression mold the halfshells of the inner layer over the core
9. grind inner cover surface to size if required
10. injection mold the halfshells of the outer layer
11. place the halfshells of the outer layer over the molded inner layer
12. compression mold ball
13. seam buff parting line
14. vibratory finish ball
15. apply primer
16. logo print
17. apply clear top coat
18. inspect and package

TABLE 11

## New 2 Piece Process

1. core rubber compound mixed
2. mill and preform slug
3. mold core
4. centerless grind core to size
5. injection mold Surlyn inner layer of the cover around core or injection mold halfshells for the inner cover layer then compression mold halfshells around core
6. grind inner cover surface to size if required
7. injection mold halfshells of the outer layer of the cover
8. place halfshells of the outer layer over the molded inner layer

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9. compression mold the halfshells of the outer layer over the inner layer
10. seam buff parting line
11. vibratory finish ball
12. apply primer
13. logo print
14. apply clear coat
15. audit inspect and package

Note: The outer layer of the cover can also be injection molded over the inner layer using conventional injection molding technology.

Steps 5 and 10 through 25 in Table 1 have been eliminated using the new technology described in Tables 10 and 11. The 30 steps used to process balata covers in the old procedure have been replaced by 18 steps for 3 piece balls and 15 steps for 2 piece balls.

Balls formed in accordance with Example 1 (100 compression) were flight tested with an automatic hitting machine using a driver, a 5 iron, and a pitching wedge. The inventive balls were compared with Titleist Tour 100 balata balls, which is a popular balata covered 3 piece ball. The comparative flight test data is found in Table 12.

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evaluated by relative comparison with other golf balls of known cut resistance.

The inventive balls formed in accordance with Example 1 were compared to Titleist Tour 100 balata, Spalding Tour Edition 100 (Soft Ionomer cover), and Ultra (Hard Surlyn cover), the comparative cut resistance data is found in Table 13.

TABLE 13

Ball I.D.	Cut Resistance Factor
Titleist Tour 100 balata	4.8
Spalding Tour Edition 100	6.2
Ultra	7.3
Example 1 ball	7.0

The data presented illustrates that the inventive ball is dramatically improved for cut resistance over the Titleist Tour 100 balata ball, marginally better than the Tour Edition ball, and nearly parity to the hard Surlyn Ultra ball.

While in the foregoing specification a detailed description of specific embodiments of the invention were set forth for the purpose of illustration, it will be under-

TABLE 12

	Carry	Difference	Total	Difference
<u>HARD DRIVER- 7 Degree Launch Angle</u>				
Titleist Tour 100 Balata	251.0	Base	268.7	Base
Example 1 ball	252.3	+1.3	272.2	+3.5
<u>HARD DRIVER- 9 Degree Launch Angle</u>				
Titleist Tour 100 Balata	250.5	Base	258.7	Base
Example 1 ball	254.0	+3.5	263.7	+7.6
<u>HARD DRIVER- 11 Degree Lauch Angle</u>				
Titleist Tour 100 Balata	249.6	Base	255.0	Base
Example 1 ball	255.0	+5.3	262.6	+7.6
<u>FIVE IRON</u>				
Titleist Tour 100 Balata	166.6	Base	183.8	Base
Example 1 ball	167.1	+0.5	182.0	-1.8
<u>PITCHING WEDGE</u>				
Titleist Tour 100 Balata	102.6	Base	107.9	Base
Example 1 ball	103.0	+0.4	106.8	-1.1

The comparative flight test data inventive ball is measurably longer than the Titleist Tour 100 ball off the hard driver at 7, 9, and 11 launch angles. Also, the inventive ball has parity holding with five iron and wedge shots.

Balls formed in accordance with Example 1 (100 compression) were subjected to the standard cut resistance test of Wilson Sporting Goods Co. The cut resistance test is conducted using a True Temper Driving Machine. The test club used is a pitching wedge. Six (6) balls of each type are tested and hit one time each approximately  $\frac{1}{4}$  inch above the centerline of the ball (random orientation) at standard clubhead velocities. The golf balls are inspected and graded as follows:

FACTOR	DESCRIPTION
10	No visible mark
9	Must search to find mark
8	Visible dent
7	Feel with fingernail- no cut
6	Fingernail inserts- cut
5	Fingernail inserts to core- core not visible
4	Core visible- core not cut
3	Core just cut
2	Core cut deep
1	Core destroyed

The factors of the six (6) golf balls of each type are averaged to obtain an overall factor. The golf balls are

stood that many of the details herein given may be varied considerably by those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. A golf ball comprising a core and a cover, the cover comprising an inner layer molded over the core and an outer layer molded over the inner layer, the inner layer comprising ionomer resin and the outer layer containing natural or synthetic balata as a principal ingredient.
2. The golf ball of claim 1 in which the outer layer includes a blend of natural or synthetic balata and polybutadiene.
3. The golf ball of claim 1 in which the outer layer includes natural or synthetic balata in an amount ranging from 25 to 99% of the total weight of polymer of the outer layer and a crosslinkable elastomer in an amount ranging from 1 to 75% of the total weight of polymer of the outer layer, said elastomer being selected from the group consisting of polyoctenylene; homopolymers, copolymers, or terpolymers of butadiene; and homopolymers, copolymers, or terpolymers of chloroprene.
4. The golf ball of claim 1 in which the diameter of the core is within the range of about 1.000 to 1.500 inch, the thickness of the inner layer is within the range of about 0.0250 to 0.2875 inch, the thickness of the outer

layer is within the range of about 0.0450 to 0.650 inch, and the diameter of the golf ball is at least 1.680 inches.

5. The golf ball of claim 1 in which the diameter of the core is about 1.500 inch, the thickness of the inner layer is about 0.0375 inch, the thickness of the outer layer is about 0.0525 inch, and the diameter of the golf ball is 1.680 inches.

6. A golf ball comprising a core and a cover, the cover comprising an inner layer of ionomer resin molded over the core and an outer layer molded over the inner layer, the outer layer being formed from a composition comprising:

- a) natural or synthetic balata;
- b) an elastomer which is crosslinkable with a metallic salt of an unsaturated fatty acid, said elastomer being selected from the group consisting of polyoctenylene; homopolymers, copolymers, or terpolymers of butadiene; and homopolymers, copolymers or terpolymers of chloroprene;
- c) a metallic salt of an unsaturated fatty acid as a crosslinking agent; and
- d) a crosslinking initiator which provides a source of free radicals.

7. The golf ball of claim 6 in which the elastomer of the outer layer is selected from the group consisting of polybutadiene and polyoctenylene.

8. The golf ball of claim 6 in which the natural or synthetic balata of the outer layer is present in an amount ranging from 25 to 99% of the total weight of polymer of the outer layer and the crosslinkable elastomer is present in an amount ranging from 1 to 75% of the total rate of polymer of the outer layer.

9. The golf ball of claim 6 in which the crosslinking agent of the outer layer is selected from the group of zinc salts, calcium salts, and magnesium salts of monocarboxylic acids.

10. The golf ball of claim 6 in which the crosslinking initiator of the outer layer is organic peroxide.

11. The golf ball of claim 6 in which the core is a solid core.

12. The golf ball of claim 7 in which the core is a 2 piece core comprising a center and a layer of elastic windings over the center.

13. The golf ball of claim 6 in which the crosslinkable elastomer of the outer layer is polybutadiene.

14. The golf ball of claim 13 in which the polybutadiene is cis 1,4 polybutadiene having a cis content of at least 40%.

15. The golf ball of claim 6 in which the diameter of the core is within the range of about 1.000 to 1.500 inch, the thickness of the inner layer is within the range of about 0.0250 to 0.2875 inch, the thickness of the outer layer is within the range of about 0.0450 to 0.650 inch, and the diameter of the golf ball is at least 1.680 inches.

16. The golf ball of claim 6 in which the diameter of the core is about 1.500 inch, the thickness of the inner layer is about 0.0375 inch, the thickness of the outer layer is about 0.0525 inch, and the diameter of the golf ball is 1.680 inches.

17. A golf ball comprising a core and a cover, the cover comprising an inner layer of ionomer resin molded over the core and an outer layer molded over

65 the inner layer, the outer layer being formed from a composition comprising:

- a) from 25 to 99 parts by weight of natural or synthetic balata;
- b) from 1 to 75 parts by weight of an elastomer which is crosslinkable with a metallic salt of an unsaturated fatty acid, said elastomer being selected from the group consisting of polyoctenylene, homopolymers, copolymers, or terpolymers of butadiene; and homopolymers, copolymers, or terpolymers of chloroprene;
- c) from 20 to 50 parts by weight of a metallic salt of an unsaturated fatty acid as a crosslinking agent; and
- d) from  $\frac{1}{4}$  to  $3\frac{1}{2}$  parts by weight of a crosslinking initiator which provides a source of free radicals.

18. The golf ball of claim 17 in which the crosslinkable elastomer of the outer layer, is polybutadiene.

19. The golf ball of claim 18 in which the polybutadiene is cis 1,4 polybutadiene having a cis content of at least 40%.

20. The golf ball of claim 17 in which the diameter of the core is within the range of about 1.000 to 1.500 inch, the thickness of the inner layer is within the range of about 0.0250 to 0.2875 inch, the thickness of the outer layer is within the range of about 0.0450 to 0.650 inch, and the diameter of the golf ball is at least 1.680 inches.

21. The golf ball of claim 17 in which the diameter of the core is about 1.500 inch, the thickness of the inner layer is about 0.0375 inch, the thickness of the outer layer is about 0.0525 inch, and the diameter of the golf ball is 1.680 inches.

22. A method of making a golf ball comprising the steps of:

- a) forming a spherical core;
- b) molding ionomer resin over the core to form a first cover layer;
- c) forming a blended composition of balata, crosslinkable elastomer, a metallic salt of an unsaturated fatty acid as a crosslinking agent, and a crosslinking initiator which provides a source of free radicals, said crosslinkable elastomer being selected from the group consisting of polyoctenylene, homopolymers, copolymers, or terpolymers of butadiene; and homopolymers, copolymers, and terpolymers of chloroprene; and
- d) molding said blended composition over the first cover layer to form a second cover layer and to crosslink the crosslinkable elastomer.

23. The golf ball obtained by the method of claim 22 in which the molding of the blended composition is performed under a temperature of about 250° to 350° F. for about 5 to 10 minutes.

24. The golf ball obtained by the method of claim 22 in which the diameter of the core is within the range of about 1.000 to 1.500 inch, the first cover layer is molded to a thickness within the range of about 0.0250 to 0.2875 inch, and the second cover layer is molded to a thickness within the range of about 0.0450 to 0.650 inch.

25. The golf ball of claim 24 in which the diameter of the core is about 1.500 inch, the first cover layer is molded to a thickness of about 0.0375 inch, and the second cover layer is molded to a thickness of about 0.0525 inch.

\* \* \* \* \*

# EXHIBIT 10

**THIS EXHIBIT HAS BEEN  
REDACTED IN ITS ENTIRETY**

# EXHIBIT 11

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re U.S. Patent No.: **6,210,293**

Inventor: Michael J. SULLIVAN

Issued: April 3, 2001

Appl. 09/470,196

Filed: December 21, 1999

Titled: **MULTI-LAYER GOLF BALL**

**REQUEST FOR REEXAMINATION  
UNDER 35 U.S.C. §§ 301-307, 314 AND  
37 C.F.R. §§1.913-1.914**

**DECLARATION OF EDMUND A. HEBERT UNDER 37 C.F.R. § 1.132**

I, Edmund A. Hebert, Senior Manager Product Development at the Acushnet Company Fairhaven, Massachusetts, hereby declare as follows:

1. I am employed Acushnet Company, located at 333 Bridge Street, Fairhaven, Massachusetts 02719.
2. In 1993, I was a member of the Product Testing Group at the Acushnet Company.
3. Acushnet regularly performs analysis of golf balls on the market and prepares summaries of these reports as competitive golf ball analyses.
4. Acushnet prepared such a competitive ball report in 1993 that included the Wilson Ultra Tour Balata golf ball made by Wilson Sporting Goods Co. in 1993. Redacted portions of that competitive ball report are attached hereto as **Exhibit A**.
5. Based on Acushnet's testing of the Wilson Ultra Tour Balata golf ball, the outer cover layer was the cover claimed in United States Patent No. 5,314,187 patent to Proudfit. As indicated in **Exhibit A**, the Wilson Ultra Tour Balata golf ball used an outer cover layer material that included cis-polybutadiene and synthetic balata, as described in the Proudfit patent.

Rule 132 Declaration of Edmund A. Hebert  
 Submitted in Support of Acushnet's request for *Inter Partes* Reexamination of U.S. Patent No. 6,210,293

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6. In fact, in 1993, this cover material was deemed to be "novel cover construction:"

Comments: A dual or layered construction. The softer outer cover is a rubber compound containing both synthetic balata and polybutadiene. The crosslinking chemistry used in the outer cover is the same as that used for the two piece cores. This is not a "balata" ball in the historical sense of the word, but a high performance two piece ball using a novel cover construction which contains a small amount of balata.

See Exhibit A.

7. As shown in **Exhibit A**, the outer cover layer material described in the Proudfit patent, and used on the Wilson Ultra Tour Balata golf ball had a hardness of about 52 Shore D.

8. To further verify that the Ultra Tour Balata golf ball was described in the Proudfit patent, the competitive ball report shows the inner cover layer (i.e., "intermediate layer") was made of a Na/Zn ionomer resin. Proudfit teaches that the inner cover layer was made of a Na/Zn ionomer:

TABLE 6

Composition of Inner Layer of Cover (Parts by Weight)	
Ionomer Type	Blend Ratio
Sodium- Surlyn 8940	75%
Zinc- Surlyn 9910	25%

Table 6, Proudfit Patent.

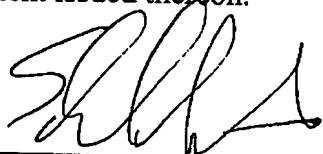
9. As tested by Acushnet personnel, the hardness of the inner cover layer of the Wilson Ultra Tour Balata golf ball was 70 Shore D.

Rule 132 Declaration of Edmund A. Hebert

Submitted in Support of Acushnet's request for *Inter Partes* Reexamination of U.S. Patent No. 6,210,293

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10. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



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Edmund A. Hebert

January 4, 2006

Date

# EXHIBIT 12

**THIS EXHIBIT HAS BEEN  
REDACTED IN ITS ENTIRETY**

# EXHIBIT 13

**THIS EXHIBIT HAS BEEN  
REDACTED IN ITS ENTIRETY**